The Builder.

No. CCLXI.

SATURDAY, FEBRUARY 5, 1848.

ON Monday morning last, at half-past ten o'clock, the committee-room at the Euston-square station of the London and North-Western Railway was crowded with persons interested in architecture and building, to hear the inquiry into the cause of the late disastrous accident there,—an inquiry most improperly and unwisely omitted, as we felt it our duty to point out, in the first instance. Besides Mr. Hardwick, the company's architect, and Mr. Sheriff Cubitt, the parties more immediately concerned, Professor Hosking attended on the part of the Government (in accordance with a request for such assistance forwarded by the jury), and Mr. Braithwaite, the engineer, was there in pursuance of a summons from Mr. Wakley, the coroner. Mr. S. Angell, Mr. E. Blore, Mr. Higgins, Mr. Poynter, Mr. Shaw, and Mr. Tite, with Mr. Grimsdell, and other well-known builders, were also present. The jury first, and Mr. Hosking and Mr. Braithwaite afterwards, having viewed the scene of the accident, the inquiry was commenced, and was continued with the greatest care and patience till nearly four o'clock, offering a very marked contrast with the former proceedings.

Mr. Hardwick, assisted by his son, on whom the superintendence of the works had chiefly devolved, was examined at great length, and described the construction of the northern inclosure of the new vestibule which fell, by means of the working plan and sections. This description we will endeavour briefly to convey to our readers, even at the risk of repetition, as it unquestionably entails matter for consideration. The wall was carried on four pairs of columns, one column immediately behind another, not side by side, standing on pedestals. Springing from the top of the columns, which were tied together by iron tension-bars, were flat arches, with a tier of York landings and brickwork to form the entablature, and on these, over the *inner* line of columns only, rose the inclosing wall, 2 feet 8 inches thick, to a height, as nearly as we could ascertain, including the entablature, of 24 feet, with a series of openings in it for windows. The back columns, it will be seen, thus took only a small portion of the weight. The columns were formed of bricks *on edge* in cement, 2 feet 2½ inches in diameter at bottom (not 2 feet 4 inches, as before stated), 1 foot 10½ inches in diameter at top, and 20 feet high. The pedestals 4 feet 6 inches high, something wider on the face than the lowest diameter of the column, and 6 feet 8 inches in depth (or thickness), were built in mortar. Below these pedestals were brick piers, with two tiers of arches to connect them, carried up from a solid bed of concrete through the ground-floor and basement beneath the vestibule, a height of perhaps 30 feet. These piers had ten courses of footings in five sets off, and were 5 feet 2 inches wide and 7 feet 4 inches in depth (or thickness). Thus, to recapitulate, there were, first, the piers and arches in basement story; the piers continued up, and arches in the ground-floor; the pedestals and columns above these piers (commencing at the intended level of the floor of the vestibule); their entablature and the wall above,—a height in the whole, from the top of concrete, of, say 80 feet. The mischief is confined to the part above the line of intended floor of vestibule: the pedestals for the most part stand, but are splintered off from the top; all above fell. Having premised thus much, we give some minutes of Mr. Hardwick's further evidence:—

"Messrs. Cubitt were the contractors for the works, from my designs. Originally a time was fixed for the completion of the works, but, in consequence of a large addition to the contract, the stipulation as to time was altogether dispensed with. The original contract was that the works should be finished about the spring of 1848, but the additional works would require at least six or eight months' more time; and the general understanding simply was, that Messrs. Cubitt should proceed with the works as fast as was necessary. The work which fell down was a portion of the additional work, and not included in the original contract. The materials were specified to be of the very best—the best bricks, the best stone lime, the best Thames sand. The foundation of the works had not been examined since the accident. It had not been ascertained that any of the concrete had been displaced. The substratum of the brickwork was as sound now as when first erected. It was an enormous foundation for such a building. He was satisfied that the fall was not occasioned by any thing which occurred with regard to the concrete or to the substratum of work. He had never any reason to complain either of the work or of the materials, nor did he know that his clerk of the works had ever done so. He (Mr. Hardwick) had never calculated the amount of loss sustained by the accident; it could not be above 120*l.* or 130*l.* He had never thought on whom the loss was to fall; he should suppose Messrs. Cubitt would make the work good. The loss would certainly not fall on the Company; they were blameless. There had not been any discussion with Messrs. Cubitt upon the subject. If the loss had been thousands, it might have been of importance; but being so small, he presumed it would not be made a matter of consideration.

Mr. Wakley—I shall ask Mr. Cubitt presently whether he agrees to build the work up again. Englishmen very seldom bear a loss of that kind unless they consider they are in the wrong.

Mr. Hardwick did not consider there was blame to be attached anywhere.

Mr. Wakley—There is none imputed. The object of the inquiry is to avoid a similar occurrence.

Mr. Hardwick—All I can say is, that if Messrs. Cubitt will not pay for it, I will, for I should be ashamed for such a question to go before the board.

Mr. Wakley—Have you yourself formed an opinion as to the cause of the fall?

Mr. Hardwick—My first impression was, that in consequence of our having gone on with the works as fast as it was possible the works could go on, the cement of the columns had not sufficiently set, though when we proceeded with the works we believed it had. The work was entirely green work, and liable from a little pressure to accident. It was a bad time of the year. The columns were constructed in November, when the weather was wet and damp. If the work had taken place in spring, no accident in all probability would have occurred. No complaint was made that the works were carried up too fast. One justification for expediting the work was the general inconvenience the public experienced from the want of additional accommodation. It was necessary cement should be used immediately after it was prepared. By being left long its adhesiveness was destroyed, and it became crumbly. A column of 2 ft. 2½ in. in diameter admitted of solid brickwork. There ought not to be any interstices, but if there were they would be filled up with cement. The columns were begun to be built with the bricks lying flat, but soon after the plan was changed, and the bricks were laid on their edges. Roman cement was used. There was no specified proportion between cement and sand. When the cement was good, the union produced between it and brick was as firm as stone. The substance became a perfectly indurated mass. No specification was made as to the mode of laying the bricks, whether flat or on edge. To the architect the difference was of little moment, because the principle of constructing a column was, that it ought to be one solid mass of material formed of brick and cement. If the cement was not good and the combination well formed between it and the bricks, the column would not be safer by the bricks being laid flat instead of on the edge. The danger would be the same. In using the bricks on the edge there was less cutting of the brickwork than in using the bricks flat. He could not at the moment remember any building constructed in a similar manner, but brick columns were very common. He had built a great many brick columns, but he had never had his attention particularly drawn to the subject, he always having trusted to the judgment of the workmen.

By a Juryman.—The columns were entirely crushed by the weight of the brickwork above falling. The general work was to be partly mortar and partly cement, but the columns were to be all cement. He had inspected them, and found them all cement and brick, but the cement was not in some portions of them sufficiently set. In saying this he did not mean that there was danger from pressure, but that it was likely the work might receive a lateral injury from the scaffolding, or some such thing. For example, since he had made his report upon the subject, it had been felt that the work might have been affected in some degree by the removal of the scaffolding. The scaffolding was carried to a very great height above the wall. In the course of the construction the ledgers of the scaffolding were placed close against the columns. The least movement of that scaffolding would have the effect of bending the column to which the ledger was attached. If the work had been done in the month of May or of April it would have set in a few days, but in this part of the year it would not set for several weeks. Men were employed during the morning of the accident in making some alteration in the scaffolding at the top; it was quite possible, therefore, that a movement might have taken place. The cement not being set, the slightest lateral thrust upon the columns would occasion the accident. How much greater must have been the effect of removing the whole of the scaffolding! The height of the scaffolding was so great, that it afforded a lever of enormous power when the movement took place at the very top, and this might account for the occurrence of an accident.

Mr. W. Cubitt, when examined, confirmed the statement that no time had been stipulated for the performance of that part of the work which fell: he knew of no deviation from the specification: had never doubted the goodness of the design. As to the cause of the accident, he felt ashamed to say he could not arrive at a satisfactory conclusion: he did not think the scaffolding had any thing whatever to do with it. Believed that the columns eventually would have carried all the weight; and that, if the period of the year had been more favourable, the work might have been done safely in half the time which they had occupied in doing it. When examined as to the necessity of using cement fresh for such work as the columns, Mr. Cubitt said,—It is of great importance that the cement should be used at a proper period, but what that is depends much upon the nature of the cement: in 20 casks, had from one manufactory, several of them will differ from the others. Sometimes the cement requires time before it is used, otherwise it sets so rapidly as to prevent its closing up the bricks properly. Cement, when it is very fresh and new, hardens instantly, but it does not take the character of stone for a very considerable time; and that which is used fresh is less likely to do so than cement which has been kept a little time. By the touch is the best mode of judging of it, and not the eye. His workmen were picked men, and under-

stood the nature of their work. The best Thames sand was used, and the men had no inducement to hurry the work. The question as to who would sustain the loss had not been mooted. He was not prepared to answer that question, but would like to leave it to the coroner to decide, after the inquiry was over.

Robert Butterwick, the general foreman of the works, was examined, and deposed that no undue haste had been used. The foundations of the work were commenced in August, and the pedestals were begun on the 21st of October: the columns were begun on the 11th of November, and finished on the 22nd. On the 11th of December the arches were commenced; and the work went straight up from that time to the 6th of January, when the accident happened. The bricklayers were putting on the two last courses of bricks to receive the stone cornice when the accident occurred. Between the building of the entablature and the walls, from the 11th of December to the 6th of January, the columns were occasionally left, in order to carry up all the other works with the same scaffolding. None of the men complained that the work was carried on in too great a hurry, or that the materials were of an inferior description. Witness said he could not satisfactorily account for the accident; but, being pressed by the coroner, said he was disposed to think the pedestals must have failed in consequence of the wet weather, which did not admit of the mortar getting hard.

Mr. Hosking questioned this and other witnesses very closely as to the scaffolding; and it appeared that the ledgers went across the building, and were secured into the side walls, and that the scaffolding had no bearing on the work that fell, excepting the putlogs, in the usual way. Below, short scaffold poles were used as thorough putlogs, and were tied to the ledgers alongside each column, both inside and outside (touching the columns), so as to stiffen them. There were braces to prevent vibration: there was no weight on the scaffold at the time of the fall.

Butterwick was questioned as to the construction of the columns, and said he had seen columns built mostly with the bricks laid flat, but it was thought that the work would be sounder by laying the bricks on the edge, and that the columns would hold more bricks and less cement.

For our own part, we are bound to say, that columns of the diameter and height here used, constructed with either bricks flat or bricks on edge, should not be hastily depended on. The bricks are necessarily so much cut about, as to afford little solid bed, and less bond. Every thing, in such a case, depends on the cement; and if this be bad, or not allowed to indurate sufficiently, a trifling force is sufficient to produce an accident. Calculations of what such columns will bear, without knowing exactly their internal condition, is idle.

James Stephenson, the foreman of bricklayers, stated that there was no haste, no complaint. The scaffolding was put up in the usual manner, and there was no pressure upon it. He attributed the accident to the failure of one of the pedestals, which, being built with mortar and soft (though well bonded with whole bricks and flushed up), might have yielded, and thrown the weight on one column.

James Harris, a bricklayer, deposed that Gedge, one of the sufferers, had complained to him respecting the alteration in laying the bricks on their edge instead of flat, and asked him what he thought of it. Witness told him he did not know; he had seen the plan adopted in short columns, but not where there was any heavy weight. He said he considered it was rather a "comical job." Gedge, in the Christmas week, made a remark, saying that he should go to the works once too often; and he added, that he thought the columns were not strong enough to support the work above. Witness did not communicate this to any person, though he had great confidence in Gedge's opinion.

It is somewhat extraordinary that the only man on the work, so far as can be learnt, who had the slightest doubt as to its stability, should have been the sufferer. Similar instances, however, are not rare.

Mr. Christopher Bavin, the architect's clerk of the works, said the work had been executed in the best manner, and that he had never had occasion to find fault. It was he who suggested that the column should be built with the bricks on edge, because it occurred to him that the material would be more compact. The bricks were damaged by the workmen in laying them flat. There would also be less cement required. The men approved of it. He did not think that the inequality of the pressure, resulting from the upper wall being over one column only, was in any degree dangerous; he estimated that the back columns took one-third the weight, and the front columns two-thirds. He was disposed to attribute the accident to the vibration produced by the scaffolding, but could not say how, nor did he know of any defect in the scaffold.

Mr. Tite, architect, was examined on the part of Mr. Hardwick, and said he had looked at the drawings with great care; had heard all the evidence, and had formed an opinion as to the cause of the accident. He thought, from the brickwork having been carried up in wet weather, somewhat rapidly (in better weather he would not have hesitated to do it in half the time), that the brickwork in mortar was insufficiently set. The brickwork in cement would of course be better, and he did not think that the columns broke. He believed that the pedestals gave way first. "The evidence on the face of the pedestal," said Mr. Tite, "induces me to think so. It is cut off angle-ways, as if the column had slipt off it. I think the cause was this—the masons were raising the scaffolding to an extreme height above the wall. There were four men on the highest point,* and I think that the sway which their weight gave to so long a lever as 90 feet, had a tendency to pull over the upper wall, and throw an excess of weight on to the inner column, besides altering its position, which threw a pressure on the pedestal that the unsettled work would not bear. Men on a scaffold are not conscious of the danger of their proceedings. I have been on a scaffold, and when I have myself been alarmed none of the men have evinced any apprehension. By the slipping of the column, the York landings, which were above them, would naturally fall on the northern side of the wall, or outward (?), where they were actually found. In Tredgold's "Treatise on Cylinders," which I now hand up, will be found a plate illustrating the effect of altering the line of pressure in columns. In the architecture I see nothing which could have led to the accident; taking the best English and French authorities for the basis of my calculation, I have no doubt that the columns would have carried eight times the weight which was put upon them."

In reply to a question by the coroner, Mr. Tite continued—I should not blame any body for this accident. I think it is without blame. I rather refer the accident to the bad system of scaffolding adopted in England. In France they use framed timbers for scaffolding; we use a different kind for brickwork, but the framed scaffold for stonework. Ours unquestionably is much easier, and, as proof that accidents are not frequent (because of the skilfulness of the men), I may say that I have been twenty-five years in practice, and have never had an accident from a scaffold. With regard to the mode of laying bricks flat, or on the edge, in the building of columns, I always hesitate to interfere with the habits of English workmen, but I think that the change of placing the brick on the edge is advantageous, and I certainly should direct it to be adopted in future. I have no doubt that column for column it would carry more than if the bricks were laid flat. My own conviction is, that if this had been March instead of November you would never have had any inquiry of this nature.

Mr. Edward Blore, architect, said that he had carefully examined the drawings and considered the matter, and entirely concurred in the statement made by Mr. Tite. In reply to the Coroner, who asked, what steps he would take to prevent the repetition of a similar accident, Mr. Blore said, he would connect the wall during its progress with a second wall, which there is behind it at about ten feet distance, so as to steady it; but he was not certain that he should have thought it necessary to do this in the first instance.

No further evidence being offered, Mr. Wakley said that Mr. Hosking desired to give the matter careful consideration, and to offer his opinion in writing; he would, therefore, with the concurrence of the jury, adjourn the inquiry till Thursday morning, ten o'clock.

On Thursday, Mr. Wakley being too unwell to attend, Mr. Mills, the deputy-coroner, took the chair, when Mr. Tite asked permission to say, in confirmation of his opinion previously offered, that experiments had been tried on two piers, one built with bricks, flat, in cement, and the other with bricks on edge, in cement,—and that while the former was crushed by 30 tons, the latter required 35 tons. The less bricks were cut, the better they were, since they are harder outside than in. Moreover, bricks are burnt on edge. In proof of the strength of bricks, he referred to a chimney at Warrington 440 ft. high.

Mr. Mills stated that Mr. Hosking had handed to him his opinion, and in so doing had remarked that he differed in some of the minor points from those who had preceded him, and desiring to avoid the appearance of arrogance in setting up an opposite opinion in matters of no consequence, he had confined himself to a general opinion as to the fall. He would, however, willingly answer any questions. He then read the following:—

"I am of opinion that the columns, or some of them, failed under an impulse derived from the scaffold acted upon by the movements of the workmen; and the failure of any one would, under the circumstances, necessarily involve that of all the rest, and of the superstructure; the weakness which admitted of failure from such an impulse being entirely attributable to the unindurated state of the cement used in building the columns,—and that the columns broke under an impulse which I believe they might have borne safely if the cement had

* It was afterwards shewn that there was only one man on the scaffolding; three had come down.

attained the state of induration which it is capable of attaining. WILLIAM HOSKING.

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Mr. Hosking, in examination, said the columns were wholly dependent on the cement: properly bonded brickwork in mortar was capable of bearing greater weight than those columns. The pedestals would not have failed but for the columns first yielding. Roman cement, when set, was incompressible: he thought it had not yielded in the present case till the agitation of the scaffold had broken up the columns. Some impulse was necessary to produce the accident, and he could find none other than in the scaffold. In answer to the coroner—the scaffold might have been bridged over without allowing putlogs to bear on the work, but this was seldom thought necessary in practice. The columns, until indurated, were not safe: under the circumstances, the attic wall should have been delayed. Knew no fixed rule to determine when cement was sufficiently set; none but the workmen employed could judge. As to position of bricks, was satisfied that bricks laid flat could be better bonded than when on edge. In these columns the strength of the brick had not been called into action. When set they would have borne ten times the weight. In reply to a juryman,—did not think it necessary to exclude round columns, but square piers of same area would certainly be stronger, because no cutting required. In underpinning, cement was used, and it was never thought necessary to keep in the needles after filling in the new work: cement was not compressible. As to the unequal pressure, the columns would have had a better chance if the weight had been equally over the two columns, but the arrangement was not inconsistent with safety.

Mr. John Braithwaite, civil engineer, was then examined, and stated he had paid much personal attention to brickwork during thirty-five years' practice. He thought the cause of the fall was the time and the weather. Did not think the columns first failed, but the pedestals. The whole was carried up in equilibrium till the attic wall was commenced, and then, being loaded unequally, the pedestal had yielded—had thrown extra weight on front column, and this broke up, induration not having taken place. Scaffolding had not had much to do with the failure. Cement must have time and quiet. If two walls were erected, and one left quiet while the other was proceeded with, the former would be found perfectly indurated, while the latter at same moment would be green through vibration. The work had been hurried, for which the public were to blame. The public pressed on the directors, the directors pressed the architect, and the architect the builder. In proof of the danger of haste, he instanced a bridge built by himself over the Blackwater river, consisting of three arches, of 45 ft. span each. It was much hurried in dry weather, and he, feeling afraid, kept in the centres for six months. It was opened and admired, but three days after, it fell and killed two men. When he examined it, he did not find a single brick to which mortar adhered. He thought there was no undue weight on the column, and the pedestal was sufficient if it had been indurated. Mr. Braithwaite further stated that he had had the pleasure of working with Mr. Cubitt for many years, and as far as his work was concerned, had never heard of its failure before; the care he took, and the supervision he uniformly exercised, both by himself and his subordinates, were most remarkable; and he could mention works constructed by him, in far greater haste than the structure in question, which had stood without the slightest failure.

The Deputy-Coroner then proceeded to sum up the evidence. The opinion had been given in a most candid and honourable manner by Mr. Hardwick, that the work was begun and carried on a little too fast, considering the season. That gentleman had thrown some light upon it, by saying that the mortar had scarcely sufficient time, and that the erection had come down because it was not enough indurated.

Mr. Hardwick—And therefore more liable to lateral pressure.

The Deputy Coroner—The season was not *excessively* wet. The time was not pressing; the contract, as he understood it, did not require Mr. Hardwick to press it on violently, and the men were employed by day-work, so that it was not a matter of haste in that respect. The gentlemen who followed Mr. Hardwick had given opinions to the same effect, that it was not from any weakness of the columns, or the pedestals, or from too much weight being placed upon them, but the non-induration of the mortar at the time the upper part was being laid upon them was the cause of the whole coming down; and whether one column or another first burst, or whether too much weight was thrown upon one column or another, were questions which might be dismissed from the minds of the jury. The question was, whether the mortar or cement was sufficiently set to justify the building being carried to such a height. The impression of Mr. Wakley and himself was, that the mortar was not sufficiently set, and that the time was not a proper one for carrying the building to such a height. It had been suggested that the motion of the scaffold might have caused the failure; but that was a matter which, as nobody saw it, was merely a matter of opinion. Mr. Wakley's impression (which he had communicated to him that morning) was, that the shaking of the scaffold had nothing to do with it at all. It seemed, therefore, that it was wrong to carry a wall to such a height in that season; and no doubt Mr. Hardwick—for all those things rested on experience — would not again, at the same season, carry up such a structure so fast. If there had been sufficient time for every thing to set, none of the gentlemen seemed to think it would have been unsafe. Much had been said about the use of columns at all in such a wall as this; but if the pedestals were not strong enough a solid wall might have come down even sooner. It was for architects to consider whether brick on edge or brick flat were the safer; but in the present case no gentleman seemed to think that the mode of building the columns had any thing to do with it. The jury would consider all the circumstances of the case, and return their verdict accordingly.

The jury then retired, and after an absence of three-quarters of an hour, returned the following verdict:—"That Charles Gedge and James Hickey were killed by the falling of a portion of a certain building situate at the Euston-square station of the London and North-Western Railway, and that the fall was caused by the non-induration of the cement and mortar with which the building was erected, during a wet and bad season of the year. And the jury add to this verdict an expression of their opinion, that due caution was not taken in the erection of the building, considering the time of year at which it was put together; at the same time they avoid expressing any opinion respecting the general design and details of the building, as they consider them to be subjects on which the judgment of architects and builders should be founded, after reviewing the various facts relating to such buildings which may come before them, amongst which facts they consider that those which have been disclosed at the present inquest may probably be regarded as of an important character."

Mr. Hardwick begged to thank the coroner and jury for the attention they had given to the matter. It was a subject on which inquiry was necessary, and he had been anxious that it should be fully investigated.

The Deputy-Coroner said that a great deal was due to Mr. Hardwick, for the very candid manner in which he had given his evidence, which, in his humble opinion, would tend to raise his character in the public estimation. Mr. Hosking had expressed an opinion, that no one could be better judges as to when a building was being raised too fast than the workmen, and that it was their duty to complain to their employers when they thought that was the case. He fully concurred in that opinion; if they neglected to act upon it, the penalty, in most cases (as in the present instance), fell upon themselves, and therefore the fact could not be too strongly impressed upon them.

Mr. Blore said he entirely agreed with what had been stated on that subject, and he knew that architects generally were much obliged to any workman who, if he apprehended danger, would come to them and say so.

Mr. Hardwick remarked that, for himself, he always gave every encouragement to workmen, being anxious in all cases to have the full benefit of their opinion.

Something has been said, during the inquiry, of an intention to rebuild the columns and wall precisely in the same manner as at first: we sincerely hope, for the sake of all concerned, that no such attempt will be made.

ON CAEN, ITS QUARRIES AND BUILDINGS.*

SAINT Regnobert is said to have founded the church of S. John; the actual church was commenced in the fourteenth century, and the porch, the first tower, and nave are of this epoch. The choir and transept are of the beginning of the fifteenth century, and glorious in all the abundance of richness in plan, and varied splendour of enrichment in detail. There are two towers, one over the entrance front, the other at the crux or intersection of the nave and transept. They are both elaborately decorated, but from defective foundations they are considerably out of the perpendicular; and after having been carried to a great height, have been left unfinished. It is said that the famous Admiral Coligni, in 1562, directed Theodore Beza, who followed his army, to preach in the nave, in order to teach the faithful that "*money was the sinews of war.*" After which, as a natural corollary, he directed 10,000 crowns to be levied on the Catholics, as an improvement of the text. I shall not further fatigue you by allusions to any of the other eight or nine churches, of which Caen can boast, some of which have been appropriated to civil purposes, as for instance, the superb church of S. Sauveur au Marché, now used as a corn-exchange, and which contains a profusion of delightful Flamboyant and Renaissance details.

The citadel, once a fortress of considerable strength and of great extent, towers on an eminence above the town, surrounded by strong and lofty walls, rising in parts from the fosse to a height of 80 or 90 feet, with towers or bastions, connected by a curtain wall, sometimes rising from the ditch itself, another overhanging the chasm, and supported by machicoulis. There are two ancient buildings

* See p. 53, *ante*.

within this precinct, one a Norman chapel, engraved by Cotman; the other an exchequer, principally of the later period of ogival art. Here, on S. George's day, 1418, our Henry V. celebrated the festival of the saint, and held a chapter of the order of the Bath, at which twelve knights were created. As I walked along the ramparts, I looked down upon the roofs, and terraces, and gardens of the houses beneath, and my curiosity and wonder were highly excited by beautiful and picturesque dwellings that were perceptible here and there. I immediately threaded my way down the narrow streets that led from the castle, and many a carved wooden over-hanging front, many a striking interior, rewarded my curiosity, as I passed in and out unobstructed, almost unobserved, in the bustling din of the every-day business carrying on. Here is quite a mine of novelty, that would completely illustrate the domestic manners of the middle ages, opening to us novel features and unexpected varieties of detail.

But I must turn your attention to the public institutions. Immediately attached to the Church of S. Pierre, is an herb market, on one side of which passes the principal street of the town, called, I believe, that of S. Jean. The façade of the Hotel le Valois immediately faces the market next the street, and is directly opposite the flank of the church of S. Pierre. This fine building, of the Renaissance style, has a central court about 50 feet square, around which are halls and rooms, of late years appropriated (as I understood) to the meetings of the merchants as an Exchange, the Tribunal of Commerce, and other like purposes. It was erected in the sixteenth century. The front to the market-place has eight divisions, separated by attached columns in two storeys, raised on pedestals, and the cornices over profiled to correspond. An arched way leads into the court near the east end; and this feature is curious, as over it was once an equestrian statue of heroic size, such as we find in the Chateau of Blois, alluded to by Mr. Crace in his paper read last session; and as also existed over the archway of the Tribunals at Mechlin, and in other edifices of like character erected at that period. Each side of the court is decorated with handsome attached columns, niches, statues, highly-decorated windows—the uppermost of which are remarkably fine dormer ones, surmounted by gable-ends, finials, &c. In one angle of the court is an open pavilion leading to a circular-newelled staircase of stone, with its landings handsomely adorned with dressings to the doors, panelled pilasters, and friezes filled with sculpture; it leads up to an open pavilion at the top, from which is a dazzling sight of lofty elegant chimney-shafts, dormers, turrets, and other details, recalling the picturesque varieties and fancies of Blois and Chambord.

This is but one out of many revival buildings which might worthily illustrate the peculiar arrangements and taste of that period. Cotman, also, (vol. ii. p. 70) gives one of the many beautiful small fronts of houses not unfrequent at Caen, and offering most appropriate authorities for the domestic architecture of the Gothic style.

Attached to the church of St. Etienne is a public seminary, at which 700 or 800 youths receive a very superior education—326 residing in the college: there is a public library of 40,000 volumes in the Hotel de Ville, in which building is also a museum of 200 pictures, several of which are by distinguished masters. The Palace of the University is a building more remarkable for its very good taste than for its size. There are several fine lecture-rooms in it, and a museum of natural history. On an open terrace in front, next the street, are bronze statues of Malherbe and Laplace, raised on pedestals. Opposite to the University, the College of the Arts—a new building of the present prevalent style, bordering on the Renaissance,—completes the educational establishments of the town. It has a handsome entrance and inner vestibule, with niches, in which are placed bronzed busts of many of the celebrated men of France. A Civil and Military Hospital, attached to the Church of the Trinity, and a very large hospital for the poor, in the lower part of the town, attest the munificent sympathy of the city for the poor, the unfortunate, and afflicted.

There are several learned and useful societies established at Caen, for studying the antiquities, the history, the commerce, the agriculture of the department of Calvados, and for promoting the study of divinity and of the useful sciences, as law, medicine, &c. Each has its suitable appointments, and the zeal of the learned maintains the reputation of the studies and researches of the enthusiastic lovers of those pursuits.

Allusion has recently been made in The Builder to inscriptions on buildings: there is one over the door of the cloister of the Convent of the Carmelites in Caen. Perhaps I may be excused in alluding to it, although not immediately an architectural subject. The lines are these in honour of Simon Stock, one of the saints of the order:—

D Di Si scap ac ab as
um vus mon ular cepit tris
T Sæ Dæ ul in in an

To which I may perhaps be permitted to join the following parallel free version:—

W ho Si first beg pr
hen ly mon an his eaching
T wi De howled to sc t

Such, then, is a faint glimpse at Caen, its quarries and monuments, the fruits of a hurried visit of some thirty hours in the short and gloomy days of January, 1848. This town is a mine of fruitful thought to the most expeperienced—a treasury of useful examples to the student, wherein the taste may be improved, the imagination excited, and one's constructive knowledge increased. It deserves as many weeks of careful investigation, as I bestowed hours of passing attention. I well know that many of my hearers have visited this city; I trust I may induce a few now present, who may not have done so, to go and see what I have described so inadequately; and I shall be delighted if what I have said may procure to others the gratification which I myself experienced in visiting the capital of a people with whom we were once so intimately connected, and with whom we still have in common so many historical reminiscences.

A FEW WORDS ON ARRAS.

Arras is a large city on the line of the Chemin-du-fer du Nord, about seven or eight hours' journey from Paris, and is one of those fortified places with which the genius of Vaubon has bristled the north-western frontier of France, so as to defend it, at least for a time, from the approaches of an invading army. It is one of the principal towns of the Artois.

The Hotel de Ville faces a handsome Place, or market-place, of considerable size, occupying one of the sides: the other three have a colonnade as high as the shop floor, and about 6 or 7 feet wide: the fronts of the houses are supported by the columns, as the Piazza of Covent Garden, with the fronts immediately over the arcades. Each narrow front rises four or five stories high, and the gable end towards the market has a semicircular top, so that the range has a varied, palatial, and picturesque aspect, and was probably erected in the seventeenth century. The Hotel de Ville is gothic, of the usual municipal character, similar to that of the Belgian towns, and quite distinct from an ecclesiastical aspect: like them, there is a lofty perforated spire rising to a towering height, an object seen from a distance of many leagues as you approach the city. One corner of the Hotel de Ville is peculiarly attractive, being of the period of François I.; all the details designed with great purity, and executed with the utmost delicacy. And here I would pause and offer an observation or two on this period of architecture, as I have had occasion to refer so frequently this evening to the style of the Renaissance, and to express my admiration of the numerous and admirable examples found in France, whether seen at Caen, at Arras, Fontainebleau, Chambord, Blois, Ecouen, or Paris. The revival architecture of France is very superior to that of England, both in design and execution. With us it is too generally rudely designed, though picturesque and varied in outline. But in France the love of the ornate, with which the voluptuousness of form, the interpenetrating intricacy and flowing lines of the Flamboyant had imbued the people, made them desire in its immediate successor, the Renaissance, all the same brilliancy of effect. The French architects then evidently went to Italy, the native soil of ancient art, and studied the new taste among the classic monuments at that time more numerous than now. They seized the spirit of the best examples, and, adopting the mere masses of Gothic buildings, covered them with the most refined details of Roman art; the one adapting itself to the other with plastic facility. This superiority of education, this mastery of drawing, this refinement in the selection of ornament, invest the Renaissance with a character that places it on a par with that of any style, ancient or modern. Reflecting the tastes of two periods, combining them with a skill that gives the impress of an original creation, it pleases the eye and satisfies the judgment. Playful yet correct, graceful yet solid; adapted to the humblest purposes, appropriate for the highest; I consider it equal to the cinquecento of Italy, far superior to that bastard style prevalent here during the reigns of Elizabeth and James I., and too generally the production of vulgar, uneducated minds, unenlarged by foreign travel or acquaintance with the high models of antiquity. The execution alone in England is too often barbarous; so low that, now-a-days Dutch rubbish has been imported and greedily purchased, by the so-called lovers of Elizabethan art. Our friends, Mr. I'Anson and Mr. Crace, in last session, and Mr. Poynter, on a former occasion, have so ably treated on this subject, that I shall now proceed to resume our excursion through Arras.

In the centre of the smaller Place was once a Gothic building, I forget now for what special purpose destined, but I see it indicated upon a small plan of a volume on the table, containing plans of most of the fortified cities of France. And on that plan also appear several other noble Gothic churches and public edifices, swept away by the Revolution. As you turn round a street, at the further end of the Place of the Hotel de Ville, one is quite surprised to find that it opens upon another more extensive Place, still similarly surrounded by large buildings—the variety of the façades and loftiness and size of the edifices giving it an air of great magnificence. A curious historical event is connected with this Place:—One of the Counts d'Artois had his title in succession likely to be disputed, as he had no son. His countess was announced to be in such a state "as women wish to be who love their lords." People were incredulous, for his enemies circulated the report that the countess was not likely to give an heir to her lord, and that it had been got up to cover a fraudulent substitution of a son. The count, as the reputed time of his lady's confinement approached, had a magnificent tent pitched in the centre of the *grande place*, the countess was removed thither, the nobles of the country and the city authorities were summoned at the critical hour, and the countess, in their presence and that of the burgesses who chose to come in, became a mother to a young prince.

In another part of the town is a large church, in the Italian style, admirably designed and executed, the nave being divided from the side aisles by massive Corinthian columns, instead of piers, with impressive effect. To the church is attached a noble establishment, once the residence of the Benedictine brothers of the monastery. It was built some 150 years since, in the style then prevalent. Its façade is some 10 or 1200 feet long, facing a garden. In the body of the building are three large courts, two surrounded by arched cloisters, opening into spacious halls, now appropriated to lecture-rooms for clerical students. The Bishop of Arras, now a cardinal, has his palace in another portion of the building, and a considerable extent is appropriated to a fine public library, a museum, as also a picture gallery, containing some very fine paintings, purchased by the government at the annual exhibitions of the Louvre, and presented to the town. Here, then, we find at Arras, as at Caen, a college, educational institutions, a public library of tens of thousands of volumes, a museum, a fine theatre, in fact, every establishment calculated to refine, instruct, and amuse the inhabitants, and to receive and cure them when visited by disease and sickness. Where can we name English provincial towns where the same facilities for instruction and improvement are provided by the central or local government? A Parisian, it is said, is apt to exclaim, *Paris, c'est la France;* and when he points to his noble public monuments, as

the Hotel de Ville, the Palais du Ministère, the Madelaine, the Louvre, the Garde Meuble, the Place de la Concorde, the Champs Elysées, the Arc de l'Etoile, and the Jardins des Tuilieries and of the Luxembourg, embellished with marble statues, seats, and fountains, where fine art is rendered familiar even to the vulgar by the profusion of its productions to be met with in every part, we feel that they have a government who know what art is, encourage and patronise it;—they spend a million of francs, where 10,000*l.* are asked here—and they can boast of three noble libraries where we have one. The complacency, then, of the Parisian may be pardoned; but his assumption over the other cities of France may be corrected. Caen and Arras we have seen, and Lyons, Marseilles, Toulon, Bordeaux, and Rouen, and a host of other cities, may boast of their public institutions, fostered by the government, or by the munificence of the municipality, and libraries, museums, schools of design, and other institutions well stored and amply provided, as for an intelligent, a refined, an art-loving people.

T. L. DONALDSON.

PROFESSOR COCKERELL'S LECTURES ON ARCHITECTURE.

THE third lecture was delivered on Thursday, the 20th ult. The professor commenced by an inquiry into the present state and prospects of architecture, and the influence upon the art of certain features of the opinions and state of society in the present day, in which diffusion was the main characteristic. What he termed the march of mind in Europe, was considered in reference to its influence upon architecture, and the comparative decline of the classic influence, and the increase of the northern, or Teutonic, out of which the parties known as "Young England" and "Young Germany" had arisen, was dwelt upon as tending to make the Gothic style prevalent for some time to come. This feature of the time had caused a remarkable attention to archæological pursuits, which were not even confined to Gothic architecture, but extended to the styles which formed the subject of the works of Gally Knight, and of Canina. Whilst this tone of thought had one form of expression in the press, in every part of Europe, there was another form in the activity displayed in restoration. The professor referred to Cologne Cathedral as one of the most striking instances, but said that it was in this country that the architecture of the middle ages had had the greatest influence. Since the year 1818, thirteen hundred and eighty-eight churches and chapels had been built and endowed in England, and a vast number in addition had been altered and enlarged. More than this, a similar amount of activity had been shewn out of the pale of the establishment, and the Baptists alone had built 900 chapels. The professor seemed to consider, that though all these examples might not be adduced as meritorious works, their number was a remarkable evidence of the tendency to which he had alluded. He also made some remarks upon the injurious tendencies of competitions, as they are now managed, and illustrated them by saying, that since the days of George the Third, it might be said that no architect had been asked for a *design*, though all had been invited to send in plans and estimates. In fact, quantity, and not quality, was what had now to be furnished.

In the course of his lecture, the professor entered into a high panegyric of the art of architecture, and the order of mental requirements in those who would practise it. He spoke of the wisdom and forethought which the works of architecture might evince, so that the beholder felt that the architect was but the mimic of nature, in whose works there was a secret *rule*, and in which *design* might be discovered in every thing. It was therefore natural to seek for a principle, for without theory every thing necessarily was confusion. In Greece, the professor had previously said that rules of art were as regularly attended to, and transmitted from one generation to another, as rules of husbandry. He also reminded them that Augustus had commanded Vitruvius to expound the principles of the art, which he derived from Greek authors. Hadrian attached a corps of architects to the cohorts. It might be inferred that the profession of the architect was in great request during the Roman empire; the aqueducts employed a considerable number, and no doubt the baths had each their own architect regularly attached to the building, as in modern instances.

In inquiring into the influence of rule and system in the middle ages, the professor repeated the evidences he had adduced in a previous course,* from the translation of Vitruvius, and commentary upon that author, by Cæsarianus. He said that Vitruvius, or the interpretation given to him, had ever been the guide of the Gothic architects, for the diagrams to his work having been lost, the mediæval architects substituted their own interpretation. Attributing great credit to Rickman, as being the first who did any thing to systematise our knowledge of the architecture of the middle ages, orthographically considered, he said that we required the icnography also. The discovery of the whole theory was important, for all the great domes had been raised upon the principles of the middle ages, of which Wren was an able master. By perfecting this discovery, we also superadded a great dignity to the art, and shewed that it was not a matter of caprice, as had been asserted. He then cited old documents of the Freemasons, in which the name of Vitruvius was mentioned, and noticed, although at less length than in his former course, the explanations given by Cæsarianus of the text of Vitruvius, in which it will be recollected that the plans of nearly all mediæval churches were supposed to be governed, as to the positions of the columns and walls, by an arrangement of equal squares. The plan of the cathedral at Ratisbon was then deemed, if we remember rightly, to be an exception from the usual system, but the professor now shewed, from a plan contributed to him by Mr. Penrose, that the same principle was adopted, although a variation was made by having the shafts which support the vaulting, instead of the main piers, upon the intersections. In speaking of the section of these mediæval structures, as governed in general by the equilateral triangle, he instanced Westminster Abbey as an exception, and said that one mode of accounting for its great height, was by supposing it to have been intended for a church of double aisles.† The professor also referred to the forms of the east end of a church, which Cæsarianus said "the learned generally make square," which was the general form in England, and he exhibited a comparative diagram of the heights of the vaults in several different buildings, shewing the gradual increase from the height of the Pantheon, where the crown was at a distance from the pavement, equal to the span, to that of the nave and dome of St. Peter's, and lastly to that of Cologne Cathedral.—All that was symbolic in these mediæval structures, was formed upon the triangle and the cross; all the rest was designed, and was directed by no caprice. The professor argued that he had proved the value of these ancient documents, and he concluded by quoting for his hearers' amusement, the paragraph with which Cæsarianus winds up his commentary, and in which he calls upon the reader to thank heaven for the birth of the author.

* *Vide* the reports and "Commentary upon the Lectures" in THE BUILDER, Vol. IV.

† In the "Commentary upon the Lectures," in Vol. IV. of THE BUILDER, the same view has been taken, and the circumstance of there being a double range of windows in the aisle, adduced as an argument in favour of the supposition.

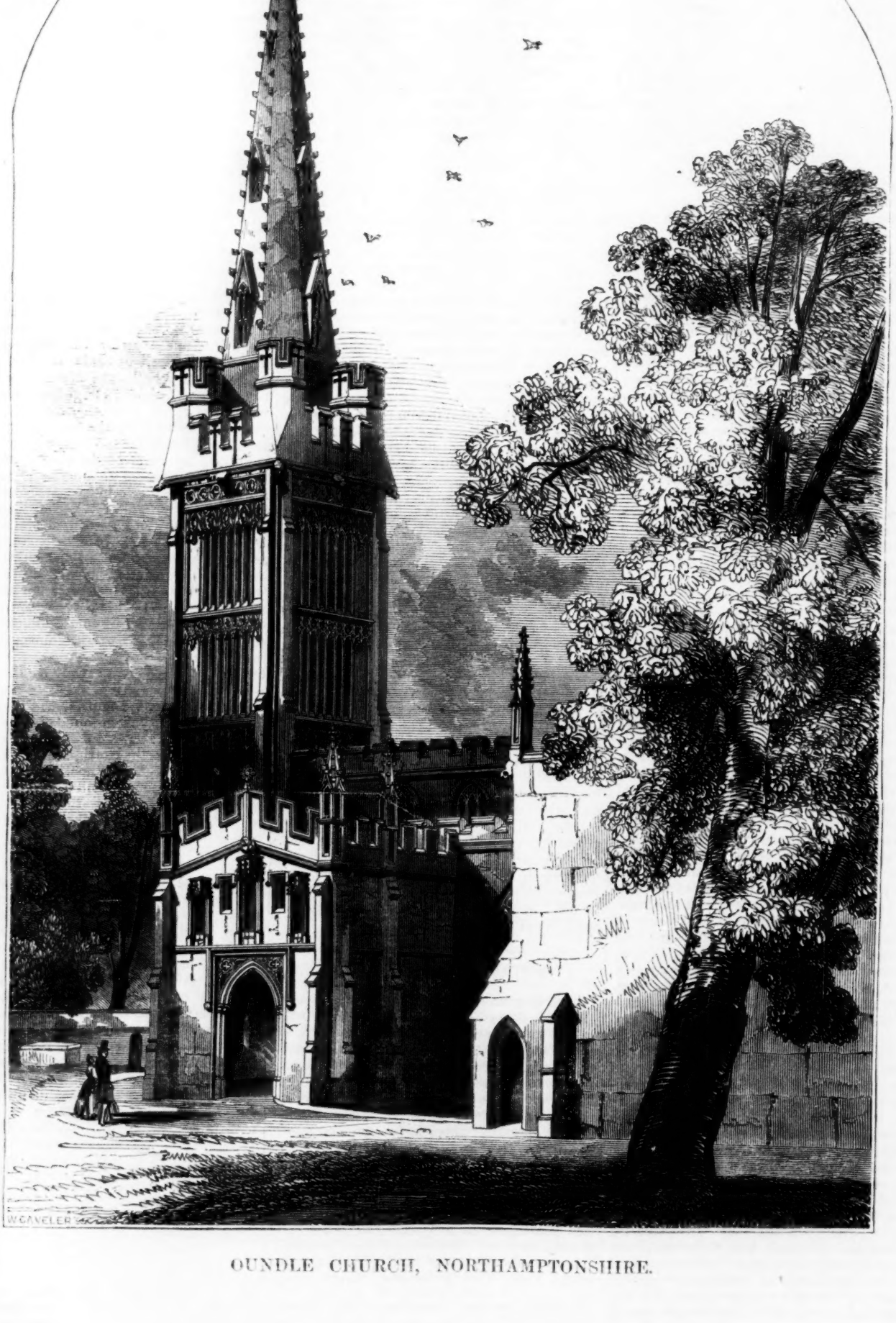
NOTES IN THE PROVINCES.

THE first stone of the Cheltenham General Hospital, now erecting in the Sandford Fields in that town, was laid on January the 25th, by Lord Dunally. It is built for the accommodation of between eighty and ninety patients, and contains two large wards on the ground floor, four large and four smaller wards on the upper floor, with operation theatre, board-room, museum, physician's and surgeon's rooms, &c. &c. Mr. D. J. Humphris is the architect. —— Mr. Rennie, the engineer, is about to commence a survey at Dover, preparatory to the construction of a pier, to extend 1,000 feet into the sea, for the mails and passengers from Calais and other continental ports.——According to the *Chelmsford Chronicle* there is some probability of the site of the Essex County Lunatic Asylum being fixed at Brentwood, instead of Chelmsford. A piece of land, consisting of 80 acres, at 100*l.* an acre, is said to be that now in view for this purpose.——We are informed, by a correspondent, that six tenders were furnished for the erection of the new Corn Exchange at Peterborough, and that the tender of Messrs. Ruddle and Thompson was accepted. The building is to be completed in June.—— The Birkenhead Dock works, it is now thought, will be re-commenced early in April, as an arrangement with the Government is said to be so far advanced that a bill has been deposited and a petition lodged in customary form. The land granted to the Commissioners on the Seacombe side is to belong to the Crown, and probably to form an arsenal, &c., the Crown undertaking to construct, at its own expense, the walls of the great tidal basin, and those fronting the river; in consideration of which, the Crown is willing to lend the Commissioners 150,000*l.* for the completion of their own outer works.——Mr. W. Rishton, surveyor of buildings at Liverpool, has prepared the following return of the number of houses and warehouses erected, or in course of erection, within the borough, from 1st January to 31st December, 1847:—Houses under 12*l.* per annum, 59; from 12*l.* to 25*l.*, 905; from 25*l.* to 35*l.*, 167; from 35*l.* upwards, 89: total, 1,220. Warehouses, 5. Houses erected since 1837:—1838, 1,052; 1839, 997; 1840, 1,576; 1841, 1,761; 1842, 2,027; 1843, 1,390; 1844, 2,150; 1845, 3,728; 1846, 3,460; 1847, 1,220: total, 19,661.——In the erection of the Manchester new Borough Gaol, since its commencement in June last, by the contractor, Mr. David Bellhouse, upwards of 7,000,000 of bricks, according to the *Manchester Courier*, have been laid, besides a large amount of stonework, iron beams, columns, &c. The central hall of inspection, with the four wings radiating from it, are ready for the roof, and the chapel is built to the level of the second story.—— Edinburgh is about to borrow a hint from Paris in providing winter amusement. The Caledonian Horticultural Society proposes a glass-enclosed winter garden, at first to be 140 feet in length by 35 in breadth, and afterwards enlarged, so as to admit of the cultivation of the most rare exotics, as well as to form a brumal promenade. The project is likely, it is thought, to meet with every encouragement. ——The clay model of the Edinburgh statue of Wellington, by Mr. Steell, is finished, and the bronze castings are to be also done at Edinburgh, the whole to be ready by June, 1849. ——The town-council of Perth having applied to Mr. Leslie, civil engineer, as to the preservation of the city from inundation, he has recommended the erection of a mound or embankment across the North Inch, and along the river side to the South Inch. The inhabitants, however, it is thought, will be adverse to any scheme involving what they will probably regard as an injury to their public park or play-grounds.

"RAFFLING FOR WORK."—A correspondent has sent us an account of "a raffle for work to be done at a public house in Union-street, Lambeth," which we should be glad to think was merely a joke, but cannot, because of the complacency and gravity with which it is told. It describes an architect in the chair, with the landlord on his right, and shows how, according to the terms of the agreement, the latter was to "stand" three bottles of port, the winner another three bottles, and every one present just what he pleased, excepting that all were to finish with brandy and water! Every man sent in his proposal, and the result was as follows:—

Holland and Son	£325
Starch	275
Spikeman	258
Trives and Son	258
Hardy	250
Chesserman	228
Stevens	227
Pritchard	226
Wilson	220
Warrup	213
and Thomas	187!

who "was declared the *winner* amidst the rejoicing of his friends." The difference, preposterous as it is, was no greater, perhaps, than might have been expected in tenders made under such circumstances.



OUNDLE CHURCH, NORTHAMPTONSHIRE.

CHURCHES IN NORTHAMPTONSHIRE.

OUNDLE CHURCH.

As some of the churches in Northamptonshire are of great beauty, and deserve to be more visited than they are, a few notes will not be uninteresting, and may be the means of making the buildings better known.

Wannington Church is considered by Rickman to be one of the most valuable churches in the county, and few persons will be disposed to dispute the assertion. With the exception of the chancel, which has been barbarously used, it is a perfect specimen of an Early English church, with a tower and spire of great beauty: the interior is very fine, presenting rather a peculiar appearance from the roof being of dark oak, forming a strong contrast with the light colour of the walls. The whole of the detail is of the most valuable description, particularly in the doors and windows, of which there are a great variety. Until very lately the whole of the interior was covered with whitewash, but owing to the exertions of the present vicar a portion of it has been removed, and much beautiful detail disclosed.

A pleasant stroll across the fields will lead from Wannington to Fotheringay (a distance of two miles). This church is better known than most of its neighbours, from a publication by the Oxford Architectural Society. It is a very good specimen of a perpendicular church; and is, with the whole of the grounds about it, kept in good order.

At about the same distance from Wannington, in an opposite direction, is Polebrook Church, another valuable specimen. The tower and spire have something the same outline as at Wannington, but are very inferior in every respect; it has, however, the advantage in its chancel, which is a very fine specimen of Early English. The north transept has a good arcade, and the other parts of the church have some curious portions well worthy of notice, including one or two early windows with transoms.

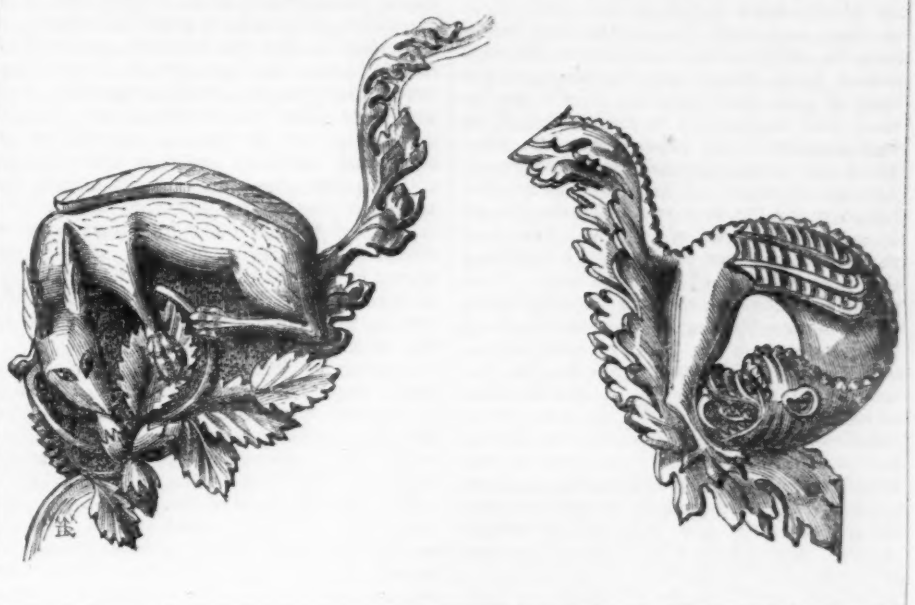
About a mile from this place is Oundle. The spire of this church is very lofty, and may be seen for some miles round the country. The tower, spire, and south porch, are the principal features worth notice, and these are best seen from the point chosen for the accompanying view: the rest of the church is not equal to these portions. There are a few decorated windows of rather curious design, but by no means worthy of imitation.

The interior is disfigured in the usual way, by much whitewash, high pews, and heavy galleries.

In the same neighboorhood are three or four other churches. Tansor is remarkable for the beauty of its situation; it has also a good Norman door. Cotterstock, Lutton, and Elton, are each worth a visit; and to the list may be added Thrapston and Lowick. In fact, there is much to interest an architect in this county, and it may be seen very cheaply and very quickly. One way is to get into Northamptonshire by the London and Birmingham Railway, making for Peterborough, and returning by the Eastern Counties, not forgetting to visit Ely and Cambridge.

* A local correspondent some time since sent us the following note on Fotheringay Church. This place, though now only a village, was formerly a market-town; and is connected with the unfortunate career of Mary, Queen of Scots:—"Edmund of Langley, the original projector of the College at Fotheringay, began his intentions by erecting a 'large and magnificent choir' at the east end of the old parish church; and, after his death, his son Edward, Duke of York, wishing to rebuild the nave of the old church, appointed trustees to carry his intentions into execution. The death of the Duke of York at Agincourt put a stop to further proceedings, but the present church is a monument of the care with which the trust was afterwards fulfilled. The plan was carried into execution by his nephew Richard, Duke of York, in the thirteenth year of Henry VI., 1435. The church stands boldly on an eminence. A tower of two storys rises above the west end of the nave. The lower story is square, and finished with plain parapet, ornamented at the angles with octagon embattled turrets: upon these were placed statues, two of which only now remain. There are two windows—one large, the other smaller—divided by plain tracery, on each side of the tower: the upper story is octagonal, embattled, and has buttresses at the angles, with crocketted pinnacles; on each side is a lofty window, which fills one compartment. The clerestory is strengthened by flying buttresses, the buttresses of the aisle are finished with a pinnacle, and between each is a window filled with handsome tracery. The aisles and clerestory are embattled. On the west front is a spacious entrance, under an arch, within a square moulding; the spandrils have an escutcheon in the centre of a quatre-foil. Above this is a large window, finished with tracery. On each side are two bold and lofty buttresses. The entrance most in use is under a large porch, of plain architecture, on the north side of the church. In the interior, beneath the tower, is a beautiful groined ceiling, which is thrown open to the nave by a lofty arch: beneath this is the font; it is octagonal, adorned with foliage and grotesque heads, within Gothic compartments, supported on a short pillar of similar architecture, and elevated upon two steps. On the west side of it is a stone pedestal, designed for the station of the priest. Baptisteries are seldom found so commodiously arranged as this is, to give the congregation a complete view of the ceremony. The nave is flanked by four arches, of light and elegant construction. The area of the church is fitted up with neat pews, and the pulpit is original and in good preservation. Many stones in the pavement contained brasses, but they have long since been erased. The length of the church is 87 feet; width, 68 feet; height of nave and groined ceiling, 41 feet; tower from floor to the roof of the octagon, 103 feet 4 inches: aisles, 27 feet to the top of the battlement; the west door, 16 feet 3 inches in width; and the great western window, 20 feet.—W. B."

CARVED ARM-RESTS, FROM WINCHESTER CATHEDRAL.



MUSEUM OF ARCHITECTURAL MODELS.

MR. EDITOR,—It is strange that there is not in this country, so celebrated for its public and private buildings, a collective series of models, so placed as to bring them into prominent view. In order to effect this, I have paid some attention to the subject, and have matured a plan which, in my humble opinion, will answer the end proposed. It is this, to establish a museum of architectural models, to consist of—

The models of cathedral, collegiate, conventual, and parochial churches, whether perfect or in a ruinous condition.

The models of all the public and some private buildings.

These models to be of three separate scales—one scale for the exteriors; another, large one, for the interiors; also a larger, for some integral portion, as may be desirable to shew the peculiar characteristics of each building.

In all cases where desirable, a model to be made, of a scale correspondent, to shew the effect to be produced by the completion of the edifice, according to the original design, which may have been frustrated by fortuitous circumstances.

The scales to be fixed, and, when decided on, not to be deviated from on any account whatever. Thus the comparative sizes will be better understood, and by this means more satisfactory ideas can be obtained.

An expense of three or four hundred pounds per annum for ten years would effect wonders. Expenses might be materially lessened by allowing parties in actual possession of the buildings, of which models would have to be made, such as deans, masters, principals, &c., to have a duplicate model, at a price fixed upon.

Should this plan be followed out, in a few years we should be able to boast of a collection of models such as no other country could produce.—I am, &c.

HENRY WALKER BENSON.

North Shields, January 17.

*** The establishment of the much-desired Museum of Architecture, long ago urged by us, and at one moment supposed to be almost in view, seems no nearer realization than it ever has been.

ARM-RESTS FROM WINCHESTER CATHEDRAL.

DURING the middle ages, the golden period for introducing into architectural accessories simple imitations of nature was the century in which flourished the "Decorated" style. Under its influence the oak, the ivy, the hazel, and other habitants of our woods were grouped round the bells of columns, or carved as if growing from the wood-work of interior decorations, with a freedom of touch which, even in imitative art, displayed perfect originality of treatment. But of all the carved works of this period which have been handed down to us, few possess so many interesting features as the far-famed stalls of Winchester Cathedral, which are profusely and elaborately enriched in every part, from their lofty canopies to the arm-rests, and again down to the subsellæ. These are a complete epitome of ecclesiastical botany, and we believe some of the plants here introduced are to be found in no cotemporary works; animals and grotesques, inseparable from medieval sculptures, and explained by the learned author of the "Mores Catholici," in his comment upon the stalls of Amiens, as an appeal to all creatures to praise the Lord, "dragons and all deeps, beasts and all cattle, creeping things and flying fowl," repeatedly occur, while costumes ecclesiastical, military and secular, are brought into the series with accurate fidelity. The two principal arm-rests nearest to the altar are especially curious, and of these we give illustrations, though scarcely is there one compartment of the stallwork unworthy of being engraved. The first represents a squirrel in a hazel tree, and the second a dragon with open mouth, executed with remarkable spirit. A circumstance attending the latter particularly merits notice. The small "perpendicular" chapel east of the cathedral, and profusely enriched with carving, contains a fine series of poppy-heads, though of late character and much mutilated. One of these is composed of two dragons in the same posture, divided by foliage, and the animals are careful and correct fac-similes of the one we now engrave, executed above a century earlier. We know of few similar examples of workmen in the middle ages, when ingenuity and imagination were proverbially at their highest, stooping to copy any previously produced enrichments. Had this principle been prevalent, the differences of style, which arose from only a few successive years would have occasioned a host of bizarriries in the sculptures and carvings of our churches.

REVISION OF THE BUILDINGS ACT.

Sir, — You apprised your readers, some weeks since, that Lord Morpeth had appointed a committee to consider the amendments of the Metropolitan Buildings Act, and whilst we may confidently expect the best results from the ability of the members of this committee, yet I cannot but feel surprised that none of your correspondents have come forward with suggestions in furtherance of the improvement of this important statute, upon which very strong opinions have been expressed from time to time.* I hope we shall not find presently that the multitude find their pleasure in criticising and objecting to the labours of the few, rather than in generously rendering timely assistance for the public weal. From the opportunities which have presented themselves to myself, I am disposed to differ from the opinion which you have expressed, that is, that it would be better to pass over the present Act, as being beyond repair, and construct an entirely new one. I think the latter course unnecessary; and, moreover, that in the end there might be the same complaints as were raised, too late, when the old Building Act was repealed; for most certainly in many quarters *nil nisi bonum* is now heard of the defunct statute. My experience leads me to think that the exercise of a little sound and unbiassed judgment, would satisfy all parties, as far at least as the Legislature ought to be expected to satisfy them, having regard to the intended purposes of the statute. Perhaps the main and only important ingredients wanting in the existing statute, are a little more perspicuity in its language and stringency in its rules and enactments, at the same time eschewing any thing approaching to "glorious uncertainty," or alternative rules. The foremost of the matters which appear to require amendment, are the proceedings to ensure the abatement of irregular (and, therefore, publicly injurious) works. To do this, the jurisdiction of the justices, under the 15th and 18th sections, should be defined, or rather the intention of the Legislature should be declared (if it be so), that they are not required or expected to set up their judgment against that of the official referees and registrar, whose decision in all matters of irregularity should of course be final and conclusive, or at least beyond the control of police courts, and perhaps of quarter sessions also; otherwise matters must stand in pretty much the same uncertain position as under the old Buildings Act.† Possibly to effect a more speedy and effectual abatement of irregular works, the district surveyor should be divested of the onerous duty and expense attending the proceedings, and an officer well acquainted with such subjects appointed for this office. Intimately connected with the subject of irregular works, is the irregularity of neglecting to give notice under section 13, before commencing works. This neglect subjects the builder (if the district-surveyor takes proceedings), to treble fees, and a heavy penalty; but under the terms of the Act, the district-surveyor does not feel that he is *required* to do so, but that he may exercise his discretion. This should not be, for there can be no doubt that much mischief is caused to houses after their original erection, by stove-setters, bell-hangers, and other workmen employed in making what are considered to be alterations too trivial for the notice of the district-surveyor, who (the workmen) in one hour may undo all the good produced by a compliance with schedule F, or other of the schedules. Whilst adverting to this schedule F, it is submitted that the *backs* of all *flues*, as well as of the chimney openings, should be not less than one brick in thickness; and further (especially if half-brickwork should continue to be allowed) that every person building a party-wall, with chimneys on his side of the wall, should be required before receiving payment of his neighbour for any portion thereof, to furnish him with an outline plan and elevation, showing the thickness of the wall, and chimney backs and flues, and the position of the chimney openings, and the course of the flues; and also the position of the bearing ends of all timbers inserted in the wall. For this a small charge might be made by the party building.

With regard to the proceedings to be taken by the district-surveyor on a builder refusing to amend irregular works, it would seem questionable whether, after the schedule, or *specification of works*, has been revised, it would not answer every purpose, besides expediting matters, if *one* official referee were authorized to inquire into, and dispose of, informations in some such summary way as is now practised at the police courts, giving the parties the option of having the question heard or re-heard, and determined, by the *two* or *three* official referees, as at present. This inquiry should be made at the works, and the decision of the official referees *read* at the office, to the parties, who should be supplied with copies of the same.

Another subject that would seem to require some attention, is section 16, as it is obvious that government buildings, and buildings erected by public companies, &c., ought to be subject to all the rules of the Act regarding fire, in common with other buildings within the limits of the Act. Again, the powers of modifying vested in the referees, would themselves seem to require some modification, if it is to be understood that, under section 11, they are not authorized to make any modification in the nature of amendment or repeal of isolated rules. Unless, indeed, they are authorized under section 14, if the circumstances of the case warrant it, to allow trivial departures from the schedules (except schedule F) to be passed without amendment. The provisions relating to party structures and their owners might be simplified. One point at least requires to be cleared up, viz. whether it is incumbent on the building owner, under section 26, to call on the district surveyor to survey, as under the two preceding sections, where the work, if authorized to be done, is done at the joint expense of building owner and adjoining owner. A supplemental section might, perhaps, be introduced which would assist an owner in procuring the rebuilding or amendment, on moderate terms, to himself, of party-walls not out of repair, and, therefore, not condemnable under the statute, but yet manifestly insufficient for the main purpose of the statute,—security against the spread of fire. This provision would take a middle place between sections 25 and 26; the former of which, as before observed, contemplates building owners and adjoining owners doing the work at their joint expense, whilst the latter throws the whole and every expense on the building owner. The remedy might, I think, be obtained by the referees being empowered, if specially called on to do so, after a wall has been certified by the district-surveyor to be in such a condition as not to require to be repaired or rebuilt, to determine whether it is not so reasonable a desire on the part of the building owner, and so beneficial to the adjoining owner's property, to have the wall amended or rebuilt, that the adjoining owner should bear at least the expense of shoring up his house and making good on his side of the wall. Such a provision would also have the effect of inducing caution and examination on the part of persons when taking leases of, or purchasing, houses presenting a fair outside. The proceedings, section 40, concerning ruinous buildings, from the very nature of the subject, require to be made as summary as certain and intelligible; and it may be here asked, whether the overseers of the poor are the most proper persons to be entrusted with the charge of ruinous buildings? The provision concerning the occupation of single underground rooms as dwellings, which are improper for the purpose, must be supposed to have quietly worked a perfect cure, or else to have had no good effect: the latter may be the case, as the statute has not imposed the disagreeable duty of enforcing this part of the law on any particular person or persons.

With respect to the schedules, a general revision (but only a revision) is desirable, as obviously this portion of the Act, being the part to which workmen and all persons immediately concerned in the execution of works are required to refer, should specify, grammatically, in the plainest and most precise and direct terms, the rules which are to be observed. In the seventh part of schedule C greenhouses, aviaries, &c., &c., are excepted from the ordinary rules, and, therefore, some special rules as to the materials, &c., of these buildings seem to be required, if schedule E does not take them in.

A clear definition of what constitutes an "attached building," as contradistinguished from an "addition" to a building, is wanted, as in this question are involved two very important considerations, viz., the thickness, and therefore, the cost of the walls, and also the fee payable to the district-surveyor on the work. The liabilities of "insulated buildings" should also be defined, and means adopted to prevent evasions of the Act after their erection. As it is now, it is supposed that a party having purchased the ground about, may build close up to an insulated building; or a large insulated building, even if of wood, may be afterwards divided into a number of separate buildings, by party-walls being built between them. Either there should be no exception made in favour of insulated buildings, or their dimensions should be limited, particularly as regards height above-ground; and they should be very distinctly required to observe the rules of schedule F (chimneys), and schedule H (drains). Schedule E, the most difficult of the schedules, requires some consideration, particularly if it be, as stated in a work recently published by Mr. Hosking, that a notion prevails that the expression "hereafter rebuilt" would be applicable only to buildings which have been rebuilt since the Act came into operation. By one rule of schedule E, "balconies, verandahs, porches, porticoes," &c., &c., and *all other* projections not forming part of the wall, may stand beyond the general line. Whilst, by a subsequent rule, "bow-windows or other projections of any kind" are prohibited, and such projections only as are by the other rule allowed to stand beyond the general line may do so. As a porch or portico, if inclosed, is as bulky as a bow-window, it would seem to be a question whether the latter rule does not refer mainly to buildings, or parts of buildings, as affecting the line established by other buildings, as contradistinguished from mere ordinary one-story appendages to buildings. If this be the rule, it is too important to be repeated, without, at the same time, giving the referees or some other authority power to relax the rule in certain cases as they may arise. Schedule H will require to be remodelled to meet all the practicable views of the new sewers commission, to whom it should perhaps be transferred eventually. Schedule I requires to be reconsidered, as it has been found to be operative—as it perhaps ought to be, with regard to partially-built streets, and old-established but unbuilt roads or ways; and the decision of the referees, to the effect that future alleys must be thoroughfares for foot passengers, deserves attention. Schedule K requires to be entirely re-written. The several modifications which the referees have made from time to time would of course be incorporated in their proper places.

There are two important points which have been omitted to be adverted to in the order of the Act: these are, first, ancient windows in party-walls; and secondly, the difficulty that arises in cases where the registrar withholds the seal from an award by the referees. On the first of these two points it would seem that great differences of opinion exist in the minds of professional men, as regards the perpetuation of window openings in party-walls on the walls being rebuilt; some persons maintaining, and the referees deciding, that the Metropolitan Buildings Act cannot deprive a party of a prescriptive right; whilst others contend that the Act will not allow the windows to be reformed, but that the next owner must compensate the owner of the window for his loss; and a third party goes further, alleging that the statute (whose schedules are to be observed "notwithstanding any thing contained to the contrary in any Act of Parliament now in force"), and not the individual, takes away the window, and therefore no compensation can be claimed by the owner thereof from his neighbour, be he building owner or adjoining owner. The other point merits the most serious consideration; for as the Act now stands, the refusal of the registrar—if his

* And suggestions too, as our correspondent will find, if he refer.

† The particulars of a case taken by Mr. David Roper, district surveyor, before Mr. Norton, at the Lambeth police court, last week, when the magistrate refused (in the face of the law, as it seems to us), to recognise the award of the referees, is before us; we defer notice of it, however, in order that we may give fuller consideration to it at this moment.

opinion be confirmed by the Commissioners of Works and Buildings—to seal the award, at once puts the case as it were into Chancery, and the effect of this may be injurious, not only to the case which has given rise to the question, but may become a direct impediment to all other parties between whom questions of the like nature may arise, and thus a rule or proviso of the Act—whether restrictive for the public, or protective for an individual—may become virtually inoperative.*

Συνεργος.

BRICKS v. STUCCO.

A CONGREVE has been fired by your correspondent, Mr. Brandon, in a late number of THE BUILDER, against the use of *stucco*. The good gentleman seems to forget there *may be* something said on both sides. As an amateur of every thing in art and architecture, I differ with him *toto cælo*. And, on the contrary, feel that the public owe a deep debt of gratitude to those architects who have and do still continue to embellish our smoky capital, and other cities and towns in the empire, with examples of architecture, that would not otherwise be disclosed to the public eye, unless to such of them as could afford to visit the continent of Europe for that intent.

There are some of us whose fondness for art is such, that we think if realities are not attainable, their accurate copies or imitations are better to possess, than not have them to look at at all. I wish, within my heart, the Government of this country had half the zeal for promotion of the nation's honour in patronising the fine arts, that they shew in a willing obedience to throw away the public money in perpetrating would-be architecture in certain royal residences. France shames us as a nation in these particulars, and always will whilst, as a people, art and architecture continue at such discount as it does with the English. What other nation but ourselves would have found a minister venturing to build a gallery for the arts with second-hand pillars and entablature taken from a little low structure, and then throw the imputation of bad taste on the architect? whilst hundreds of thousands were *filched* from the Treasury to build, with no taste at all, a royal bauble.

These are subjects for a congreve, my good Mr. B., if you will, and the Government ought to have plenty of them. But where expense excludes the possibility of using stone, I trust the architects will always be "*few*," and there may be "*several*," as Mr. B. says, too, and yet not many, as compared with the whole body, who will consent to forego the use of cement; but notwithstanding all he says, adopt the motto—"*contra audentior ito*." I recollect, in wandering through the streets of Pompeii, I entered a Patrician building, in the court of which stood the remains of an arcade; the pillars constructed of brick: these generally were covered with a *red stucco*, evidently intended as the substitute for what is now called "*rosso antico*."

The Pompeians lived in a classic age. The building belonged to a rich man, yet there was stucco! I might go on with other examples, if I had my journal here to refer to, I make no doubt. But the above circumstance I well recollect: I observed to my friends at the time,—that it seemed *rosso antico* was very valuable even in those days.

I am, Sir, &c. W. MASON.

Necton.

CITY OF LONDON UNION WORKHOUSE.—Sir: Will you ask the worthy guardians what has become of their self-concocted plan, "Vivo Spem?"—and whether it has not occupied more time in altering than the whole 41 rejected architects were allowed to execute theirs. It has been sent back from Somerset-house, as it would not bear the test: and by special permission is to be presented a second time. If I conjecture rightly, the plan will undergo such an operation as will very materially alter the estimate, if not the general appearance. This was foreseen and commented on by you in November last.

ONE OF THE REJECTED.

* Of this we shall have occasion to speak before long, and may feel it our duty to shew that within side of the Metropolitan Buildings Office it has produced a state of things very far from satisfactory.

FACILITIES FOR CHEAPENING AND PURIFYING GAS.

WE were the first to draw attention (now some time ago), to Mr. Leslie's new burner and other improvements tending to increase the purity and lessen the cost of gas, and have had no reason to retract the good opinion of them which we had expressed when the experience of them was less than it is now. At a meeting of the City Commission of Sewers, on Friday in last week, to inquire into the subject, Mr. Leslie made some statements which excited no little astonishment.

The first public experiment made by him as to the illumination, had been effected under the authority of the Commissioners of Woods and Forests, in the Queen's-walk, in the Green-park, where he had fixed his burners to eighteen of the lamps, which were 90 feet apart, and consumed 4½ feet per lamp per hour. The contrast between those lamps and the others lighted upon the usual plan, was most palpable. The next experiment was made by him at the Post-office, perhaps the largest affair of the kind in the world,

The saving effected at the Post-office in the first week of the present year was 23,600 feet; in the second week it would be 54,000 feet. He had undertaken to save them 1,000*l.* a year in the lighting. His mode was now being applied at the Ordnance and other Government offices. When asked by Mr. Lawrence at what cost the Commissioners of Sewers ought to be able to make and supply gas themselves, Mr. Leslie said at 3s. per 1,000 feet, which would include cost of plant, mains, &c. He dwelt much on the benefits of purification, and asserted, as we have before done, that ere long the public will demand a purer gas than that with which they are now supplied.

It appears that 2,700 street lamps are lighted in the City by the commissioners, and cost between 11,000*l.* and 12,000*l.* per annum. The lighting of the prisons and other buildings is extra.

THE WORCESTER LUNATIC ASYLUM COMPETITION.

SOME months since the magistrates of Worcester advertised for designs for an asylum, and, in due course, twenty-seven architects sent in designs, of whom three sent two each, making a total of thirty designs.

The advertisement announced that prizes of 50*l.*, 30*l.*, and 20*l.* would be given to those gentlemen whose designs the committee considered entitled to stand, in point of merit, first, second, and third. After consideration, the magistrates awarded the first prize to Messrs. Hamilton and Medland, Gloucester; the second to Mr. F. J. Francis, of London; and the third to Mr. S. S. Markham, of London. After some delay, the Committee of Visitors have determined on adopting the first design. If the Commissioners on Lunacy approve of it, it will be erected, with such improvements as may be suggested, and the authors of it will be employed to carry it out. The site is said to be one of the most beautiful spots in the county.

PREVENTION OF FIRES IN WAREHOUSES.

SIR,—We have had a great number of fires in Liverpool warehouses, and found great difficulty in getting at the place where the fire was (many of our warehouse rooms being above 30 yards long, and full of goods). Lately, in the case of Mr. R. Gladstone's warehouse, for example, the great body of smoke kept the firemen out for a long time, and though from the first there was plenty of water, it had no effect, as the iron doors could not be got at to open them.

Having witnessed the great difficulty to get at the fire in the above case, I have sketched a plan, by means of which, if we have a good supply of water, any fire can be flooded without the firemen being exposed to either smoke or fire, and beg leave to send you the heads of it:—The stairs are to be open to the street all up, the steps to be of stone or iron. I propose to have an iron water pipe from bottom to top of the warehouse in one corner of the stairs, so that access could be had at all times. This pipe must be supplied by a strong force of water from below, or from a cistern at the top of any building where used.

To each warehouse floor an iron pipe with round holes at each 3 feet, is to be carried round each room, and attached to the service-pipe, and to each floor a tap is fixed to let the water play when wanted. The service-pipe to have a tap at the bottom, if served from a street main water-pipe, or at top if served from a cistern; the pipes to be kept empty until wanted.

On each landing on stairs there must be a place to screw a brass pipe to, to play in the room, if the iron pipe is not thought needful. The doors into each room to be of iron, and hung so that when the door bar is drawn the doors will open by their own weight.

The iron rod that fastens the warehouse doors should be brought through the wall and fastened on the stairs, so that it can be got at any time.

Liverpool. JAMES THOMSON.

METROPOLITAN COMMISSION OF SEWERS.

A MEETING of the Metropolitan Commissioners of Sewers was held on Thursday, the 27th ult., in Committee Room, No. 23, New Houses of Parliament. Lord Ebrington, M.P., in the chair.

The Clerk read a report from Sir H. De la Beche and Mr. Chadwick, on the subject of the proposed Ordnance Survey of London, giving reasons for its commencement in Westminster, and recommending that "a block plan should be completed for the district bounded by Bridge-street, Great George-street, Bird-cage-walk, Constitution-hill, Hyde-park-corner, Knightsbridge, Brompton-road, Fulham-road, Park-place, Milman's-row, and the river line from Milman's row to Westminster-bridge." The report continued,—

"We have further to report that the survey has been commenced at the points we recommended, and that under the authority of the orders of the court, a portion of the Sewers Office in Greek-street, has been set off for the accommodation of the officers of the survey; that the upper part of the premises of the Sewers Office, Hatton-garden, and a part of the house and office of the Sewers Commission for the Tower Hamlets, have been occupied for the lodging and accommodation of non-commissioned officers and men of the Sappers and Miners engaged in the work of the survey."

Appended to these reports were a series of questions put to Mr. Wilson, one of the parochial officers of St. Margaret's, before the Sanitary Commissioners at Gwydyr House, with his answers thereto, setting forth that in various parts of Westminster, particularly in the neighbourhood of Buckingham Palace (viz. Palace-street, William-street, &c.), the refuse of cesspools in the houses is pumped into the streets, where it is frequently suffered to remain until a shower of rain falls to wash it away, and that many of the basement stories are uninhabitable from the offensive exhalations arising from the cesspools; and although sewer rates have been paid for centuries, yet little benefit has been derived therefrom. The reports were received and unanimously adopted.

A letter was received from Mr. Abraham, the architect to the Westminster Improvement Commissioners, as to the drainage of houses falling within the range of the projected improvements from Vauxhall-bridge to the Broad Sanctuary. The clerk suggested, that as a question might arise between the Commissioners of Woods and Forests and the Improvement Commissioners, it would be perhaps prudent in the first instance to refer the subject to the General Purposes Committee, which suggestion was agreed to.

A document was received from Mr. Bardwell, of Great Queen-street, Westminster, on a subject mooted at a former court, having for its object the collection of the sewage of the whole of the metropolis into reservoirs, to be placed at three selected points, so that the entire of the refuse matter at present discharged into the River Thames might be withdrawn, and converted into a valuable manure for agricultural purposes. He proposed in his plan the formation of three reservoirs for that purpose: the first, to be on the banks of the Kensington canal, a length of 3¾ miles; the second, on the banks on the River Lea, 5½ miles in length; and the third, 4¼ miles, near the Surrey Docks, and the estimated cost as follows.

The first reservoir, 3¾ miles		£93,480
The second do. 5½ miles		165,320
The third do. 4¼ miles		59,840
		318,560
Three depots, with plants to each	£35,000	105,000
Total cost		£423,560

By this scheme, it is calculated that the three reservoirs will intercept 200,000 tons of solid matter, which, when manufactured by Robinson's

process as at Montfaucon, will sell for 4*l.* per ton, and deducting 1*l.* per ton for its manufacture, the result will be three times 200,000*l.* or 600,000*l.* per year. Liebig estimates it at 700,000, and Dr. Graham at 720,000 tons, which, if treated according to Mr. Bardwell's plan, would produce upwards of *two millions sterling per annum*, by which plan, eventually, sewer-rates might be altogether abolished.

Mr. E. Chadwick thought it better that these matters should be, in the first instance, referred to the General Purposes Committee, as, by being thus brought forward, the time of the court would be occupied, and when brought from the committee, the whole matter would require consideration *de novo*.

The subject was referred accordingly.

Mr. Chadwick laid before the court a very voluminous report, drawn up by Mr. Lovick, the surveyor to the Paving Board of the united parishes of St. Andrew, Holborn, and St. George the Martyr, which pointed out the great defects of drainage in that locality, and said the information contained therein had been obtained from the inhabitants themselves, who had been visited, house by house, and in every case the inhabitants testified the liveliest interest in the proceedings adopted for their comfort and cleanliness. The report particularly alluded to the state of Baldwin's-gardens, where the most noxious exhalations were emitted from cesspools, only four feet from the basement. Mr. Chadwick said he thought this was a fair specimen of the evils they had to deal with and to remedy. To show that persons were alive to habits of cleanliness, he found that in many cases the practice of sweeping and sanding the doorways had re-appeared in districts where it had rarely been in before. He moved that the thanks of the court be given to the Paving Board of St. Andrew's, Holborn, and St. George the Martyr, and to Mr. Lovick, the surveyor, for the zeal and ability displayed in conducting the inquiry, and for the able report presented to them.

The Hon. F. Byng hoped they should not alone have to tender their thanks to the parish of St. Andrew, Holborn, for instances of want of sewerage were not wanting in many other districts. St. James's parish, Westminster, alone, contained 168 streets and alleys, and out of this number 58 were totally without sewers, and the greater part of those where sewers did exist were very old, and as far as he knew of the locality, not 1 in 7 of the houses communicated with any sewer. The resolution was then put and agreed to.

Mr. Broderip hoped that other boards would act in the same spirit, for he knew that so far from the poor objecting, they were eager to receive the benefits of cleanliness. He thought, in every case, there should be an abundant supply of water, for he knew that in the hot months frequent private quarrels arose from the scarcity of water.

Lord Ebrington said he received a communication lately from Dr. Farre, that many of the inmates of workhouses were suffering from the want of proper drainage. Referred to the surveyor.

The Dean of Westminster mentioned to the court that within the last few days four men had been employed in cleansing cesspools within the precincts belonging to the Dean and Chapter of Westminster, and during that time the progress of the works had been watched by Mr. Glass, chemist, and the clerk of the works, and their reports, for which they were responsible, were highly satisfactory. Sir W. Burnett's fluid, consisting of the chloride of zinc, had been used for the purpose of deodorization,—four cube yards of soil having been completely deodorized by ten quarts of fluid, and removed in two hours by four men. The men coming new to the work, it was believed that when they were organised, they would do twice as much work in the same time. He certainly felt surprised when a man stood over a cesspool, and the more the deposit was disturbed the less odour arose. He did not quite agree with those who considered cesspools tainted adjoining wells. He knew several cesspools near to wells, wherein not the slightest impregnation by percolation had occurred to the water, which he attributed to the filtration through a fine substratum of gravel in that neighbourhood.

Mr. Chadwick could not allow this statement to go forth unqualified, for he knew in many instances wells had been abandoned, the cause being traced to offensive cesspools.

Mr. Leslie said he had himself a good well situate some distance from the cesspool, but still he found the water tainted, but could not ascertain the cause until he had the cesspool taken up and removed, when the water became again pure. The deodorizing fluid might successfully neutralise the smell, but still he hoped that as cesspools were cleansed, they would be filled in, for he looked upon them as the pestilences of the land.

Professor Owen said the filtering alluded to by Dr. Buckland could only apply to clean gravel.

Mr. Chadwick said a list of regulations had been drawn up for voluntary associations, having for their object the cleansing of courts and alleys. In addition to Sir W. Burnett's fluid, others were in course of trial, and amongst them the chloride of manganese, and with every prospect of success; but before they could supersede cesspools, they must have not only an abundant but a continual supply of water, and then they might hope to annihilate the evil.

The surveyors then presented the following report on the flushing and cleansing of courts and alleys:—

"Since the last court, deposit has been flushed away from sewers hereunder named:—

	Length in feet.	Double loads.
In the Westminster division.....	16,599	3,535
,, Surrey and Kent.....	10,866	1,513
,, Tower Hamlets	6,746	899
Open sewers in Surrey and Kent.....	14,215	1,323
Amounts reported at the last court....	22,400	3,386
Making a total of.....	70,826	10,656

In cleansing cesspools, courts, and alleys, Sir William Burnett's deodorizing fluid has been used a sufficient length of time to ascertain the quantity needful for cesspools of large size. The surveyors are now about using M. Ledoyen's fluid, and propose afterwards to use Mr. Ellerman's in a similar manner, as also a fluid sent by Mr. Herapath, of Bristol, to arrive at a result that will enable us to say which fluid will be the cheapest."

The report was received and adopted.

Upon the recommendation of the committee for a rate of 8d. in the pound on the Kent and Surrey division being read, Mr. Hutton said he wished to offer a few words in explanation of this subject. This rate had been agreed to by the late commissioners, and in now ordering it to be collected, it was to enable the present commission to liquidate the outstanding debts of that body. His object in thus mentioning it was, that it might not go forth that the commencement of the operations of the new commission was to be accompanied with the imposition of a large rate. The rate was then agreed to.

A letter was read from Mr. Gwilt, one of the late surveyors of the Kent and Surrey Commission, in answer to the subject discussed at the last court as to his continuance in the office of surveyor. He stated that he considered any formal resignation of office was unnecessary, as he, in common with others, had been superseded on the issue of the present commission; but having held the office for nearly forty-six years, he thought he was entitled to some compensation for its abolition.

This letter was referred to the Committee, and after some routine business had been transacted the court adjourned.

Correspondence.

CAEN STONE.

Sir, — A few inquiries appear to suggest themselves in reference to the discussion on building stones, at the Institute of British Architects, as reported in your valuable paper of the 29th inst.

In what respect is it "difficult now to get stone from the beds, from which the early buildings in Caen were erected?"

How to distinguish between what is stated to be "very durable, and some that is by no means so." Is it not desirable that well-seasoned blocks should be available in the London market, for any work on the point of commencing, so that the quality and date of importation might be properly attested?

Is there not some risk of change in the transit, if stones are selected at the quarry?

I am surprised that a statement should go forth, that "blocks of Caen stone may be placed in construction in any direction, except when the white veins are perceptible," an opinion from which you most properly dissent, but it is a question which should at once be set at rest. If "the most experienced eye can hardly detect the different qualities of the stone in the block, when once they have been removed from the quarry," what test should they be submitted to before being used in a building?—I am, Sir, &c., L.

Pimlico, February 1, 1848.

Miscellanea.

Union of Cast-iron with Copper, Wrought-iron, Steel, &c.—The process patented by Mr. Perlbach consists of the preparation of the copper by filing, or the wrought-iron by acids and alkalis, to clear the surface of oxide, after which it is plunged into a bath of tin 95, copper 5 (or more copper and less tin for large surfaces), and then laid in the cast-iron mould so as to allow the cast metal to be poured upon it to the requisite form. When united with copper, the metal must be poured in at as low a temperature as possible.

Institute of Mechanical Engineers.—The first annual meeting was held at the theatre of the Philosophical Institution, Cannon-street, Birmingham, on Wednesday week. In the absence of the president, Mr. J. E. M'Connell took the chair. Mr. Fothergill read the report prepared by the council, congratulating the members on the successful progress and prosperous condition of the institution, which now numbered 103 members, and four honorary members; and calling upon the members and friends of the institution to renew their efforts to promote its further rise and success. Mr. Alderman Thornton gave the following account of his new hydraulic jack:—"The principle of this jack is the same as that of the hydraulic press. Its advantages are the ease and steadiness with which a great weight can be raised by one person; the facility with which the lowering of the weight can be regulated without labour; and from there being no circular motion of the handle, there can be no tendency in the jack to twist from the position in which it is placed; also, by the use of strong wrought-iron tubes for the cylinder and ram, the weight of the jack is less than those now known. This jack can be used in cases where others are available, and in some where others are not so; for the motion of the lever being vertical instead of lateral, it can be used wherever there is a sufficient width to place it. With a jack of the size shown, one man can lift from 15 to 20 tons weight." Considerable discussion ensued upon the merits of the invention, in which the Chairman expressed his opinion favourably of it, as did also several other members.

Roman London.—Last week, in excavating for the foundation of the new Coal Exchange, in Thames-street, a red tesselated pavement, and the remains of a hypocaust were discovered. According to our informant, the warm air chamber is 20 inches high, and consists of a series of pillars, composed of 14 tiles, 8½ inches square, 1½ inch thick, and 1 foot 5 inches apart, paved and covered with large tiles 1 foot 11 by 12 inches, and two inches thick. At a meeting of the British Archæological Association on Friday evening, in last week, drawings of the remains were exhibited and a description given. The apartment containing the arrangement for warming is semi-circular on one side, which projects beyond the outer wall of the other room, and has a recess in the wall, or seat for two persons. The outer-wall of the semi-circular apartment has been entirely removed at some remote period, but that of the other room is in part standing to the height of several feet, and is entirely composed of long flat red tiles, with an occasional course of pale yellow ones. The remains are about 13 feet below the pavement of Thames-street, shewing how much the level has been raised since the time of the Romans.

The Cab-Stand Nuisance.—A *quasi* "Cabman" has addressed a letter to us in reply to Mr. Waller's statements, commencing:—"Whilst in the coffee-house many of my fellow-cabmen sleep, others smoke and discuss the Parliamentary debates of the week, I, with the feelings of an emigrant reading of his fatherland, examine in The Builder (they take it in here) the transactions in those fields of science where I rambled a boy, and which I cultivated in my youth. It were right to say that I was brought up an operative. What thorny paths I trod, accompanied by pale sickness and flesh-fed want, until I came to this *stand*, it is needless to say. I fell, as many a better man has done, and I am now (I should have been ashamed at one time to write it) a common, though not despairing, cabman." He jokes on the attempt to get rid of what he does not think a very great nuisance, asks who is to pay for the proposed covered places, and thinks inconvenience would result from putting the cabs out of sight. In truth, however, the cab-stands *are* a great nuisance, and though, as he says, there exist worse, and "he would have the giants tamed and leave the pigmy for a time," it is desirable we should see all our foes before us, so that we may knock them off one at a time, as opportunity occurs. "Cabman" wisely asks for more *water*. We would have all London shouting for the same thing as if every house were on fire, and will gladly aid to raise the cry.

DEVIATIONS FROM CONTRACTS.—Some of our readers will remember an action brought by Mr. Kirk, a builder, who had undertaken to erect the Union workhouse at Bromley, against the guardians of the Union, in 1846. There had been certain deviations from the plans and specification originally agreed upon under the contract, for which additional work he had charged the guardians, but they had resisted the payment of these items of charge. The plaintiff had alleged in his bill that he was, by the terms of the contract, empowered to make deviations if approved of by the clerk of the works, and this he alleged he had obtained. The Vice-Chancellor had, consequently, made an order in his favour, and from that decision the defendants appealed. The appeal was heard last week, when the Lord Chancellor was of opinion that the plaintiff had failed to make out such a case, and was not entitled to any relief, as he had not proved that he had obtained permission from those who employed him, and were to pay him, to depart from the terms of the contract, by which only the parties were to be bound. The order of the Vice-Chancellor was therefore reversed.

SELF-ACTING EFFLUVIA TRAP.—Mr. Rettie, of Richmond, has addressed to us some indignant letters in respect of the effluvia trap registered* by Messrs. Bunnett, and lately illustrated in our pages. Mr. Rettie says he patented the trap in June, 1846; and that in July, 1847, "Mr. Bunnett applied to me to be employed to make them, and to have a licence to use my patent. He got the drawings and models. Finding it to be a good thing, he registered my effluvia trap as his own, and took it to the Commissioners of Sewers, where Mr. R. L. Jones challenged him on the very subject; and I hold letters to my solicitor, stating the fact, in Mr. Bunnett's handwriting." We feel bound to give Mr. Rettie's statement, the similarity being evident, but cannot further pursue the subject, or afford space to half-a-dozen other letters which we have received: our advertising columns are open, and the law will surely afford redress for injury. Mr. Bunnett considers that he has made certain improvements in the arrangements; he does not claim the invention.

THE COMPENSATION CASE, BATTERSEA PARK.—On Friday in last week Mr. Chambers, in the Court of Queen's Bench, moved for a rule calling upon the Commissioners of Woods and Forests, and also upon the sheriff of Surrey, to shew cause why a prohibition should not issue, directing the sheriff not to record the verdict and judgment of the jury in Mr. Chabot's case. The learned counsel said some confusion must have been caused in the minds of the jury by a dispute that existed with the corporation respecting the greater portion of the land. The sheriff unfairly and unjustly omitted to ask the jury, as pointed out in the statute, the exact portion of the land on which they found their verdict. The jury had no right to inquire into the question of title, and no doubt found for the two or three roods of undisposed land, and not for the whole. Lord Denman thought the case one in which a rule should be granted, and it was granted accordingly. A claim by Mr. Paine, which was to have been tried on Tuesday last, is postponed for a time in consequence.

INSTITUTION OF CIVIL ENGINEERS.—At the annual general meeting of the institution, held on Tuesday evening, the 18th ult., the following gentlemen were elected to form the council for the ensuing year:—Mr. Joshua Field, President; Messrs. W. Cubitt, J. M. Rendel, J. Simpson, and R. Stephenson, M.P., Vice-Presidents; J. F. Bateman, G. P. Bidder, I. K. Brunel, J. Cubitt, J. Locke, M.P., J. Miller, W. C. Mylne, T. Sopwith, J. R. M'Clean, and C. May, members; and J. Clutton and T. H. Wyatt, associates of council. The report of the council continued to be very encouraging, and shewed that the progress of the society was steadily good. Telford medals were presented to Messrs. Jackson, Richardson, Murray, Glynn, and Frodsham, and to the two former gentlemen council premiums of books were added. Telford premiums of books were also awarded to Messrs. Elliott, Heppel, Shears, and Masters, for their communications made during the past session.

* Not *patented*, as we stated in accordance with the information forwarded to us.

COMPETITIONS.—A plan is wanted for a county lunatic asylum for Wiltshire, to accommodate 250 patients, and capable of extension. No premium is announced.—Plans are also wanted for new gas-works for Belfast: premiums—first, 50*l.*; second, 25*l.*; third, at discretion of the Town Council.—Plans of complete sewerage for Gloucester are wanted: premium, 75*l.*—Tenders are also wanted for surveying and mapping the parish of Battle, Sussex.

PROJECTED WORKS, &c.—Tenders have been called for by advertisement for the erection of a wing to the Littlemore Lunatic Asylum, near Oxford; for maintenance of the permanent way of the Midland Railway between Nottingham and Lincoln, with branch; for erection of four stations on Yorkshire Junction Railway; also for stone paving the carriage and footways in the City for three years.

IMPROVED SASH FOR LUNATIC ASYLUMS, &c.—A model of a sash and frame (arranged by Henry Lane, of Upper Tooting) has been submitted to us, which appears to possess advantages for lunatic asylums, workhouses, and schools. The sashes are proposed to be of iron, in small squares, and each row of squares is made to open outwards from its top, by means of a quadrant acted on by an endless chain and small wheel, turned by a key, so that when open the sash-bars present a guard against patients escaping or children falling, yet offer no obstruction to free ventilation. Amongst its other apparent advantages are these,—that at whatever height it may be fixed (as on staircases) it may be opened and shut by a person standing on the ground, and can be opened and shut only by the right person. Whether sufficient strength can be given to the attachment at the angles to prevent mischievous patients from wrenching out a row of squares we cannot say positively, but the arrangement decidedly deserves examination by some who might be able to assist the inventor in carrying it into practice.

MARTIN'S IMPROVEMENTS IN DRAINING.—Mr. John Martin, the well-known artist, has patented a mode of constructing water, sewerage, and gas pipes, of which a prospectus is now before us. We shall take an early opportunity of inspecting the materials themselves, and in the mean time may say that the patent embraces, at all events, one very important matter, namely, a means of so *coupling the pipes* as will prevent one pipe settling away from another, and the consequent leakage, as may be the case when they are simply butted against one another without a socket, and yet give the greatest facility for taking out one or more lengths without injury. The mode is exceedingly simple and apparently effective.

WESTERN LITERARY INSTITUTION.—We are glad to find that the Western Literary and Scientific Institution, in Leicester-square, the continuance of which was thought to have ceased, has been re-organized by the late secretary, Mr. Malcolm, and offers the same great advantages to the inhabitants of the locality as heretofore. The library remains, and the rooms have been fitted up very neatly. Irrespective of the, weekly lecture, last Monday Bishop's patent "Self-acting Breaks for Railway Carriages" were illustrated; and next Monday Mr. Cantelo's steam "Egg-hatcher" will be described.

ELECTRO-TELEGRAPHIC.—An American projector proposes an electric-telegraph from the Atlantic to the Pacific. It is already carried from the Atlantic to St. Louis, in the valley of the Mississippi, whence the distance to the Pacific is 2,000 miles, and the estimate is that the line could be formed for 300,000 dollars.

IRONFOUNDERS' ESTIMATES.—As a proof that ironfounders are not more particular in the preparation of their estimates than some builders, we publish the result of a competition for a cast-iron bridge, of 35 feet span, proposed to be erected in the city of Chester, from the design of Mr. Baylis, borough engineer:—

J. Williamson, Stockport	£220	10	0
W. Mabon, Ardwich, Manchester	212	11	3
Teyburn and Co., Warrington	210	15	0
W. Glasgow, Manchester	180	0	0
R. Pauling, Manchester	178	10	0
Juland and Longdon, Manchester	170	13	0
Ogle and Son, Puston	150	0	0
Messrs. Johnson, Chester	149	0	0

The lowest tender was accepted.

LANDLORD AND TENANT: BREACH OF CONTRACT.—On the 20th ult. an action was tried at the Sheriff's Court, brought by Miss Robinson, sister of Dr. Robinson, of Brompton, against Mr. Pearce, for breach of contract. The defendant had agreed to take a house in Sloane-street, Chelsea, for the term of ten years, at the yearly rent of 70*l.* Under the covenant, alleged to have been broken, the defendant had bound himself to expend the sum of 200*l.* in repairing the premises; also to insure them to their full value; and that in case he wished to convert the house into a shop, he should obtain the plaintiff's consent and the sanction of Lord Kensington, the ground landlord. The defendant refused to comply with the terms of this covenant, although he had signed it, and he offered to throw up the contract and pay down a quarter's rent as a forfeit for the breach. This was, however, declined by the plaintiff. The defendant, in defence, said he had not been able to perform his part of the contract, but he offered a quarter's rent as compensation, which sum he thought ample remuneration for any loss the plaintiff might have sustained. The jury found for the plaintiff,—damages 40*l.*

GALVANISED IRON.—Mr. R. Hunt, in the course of a lecture on mining, recently delivered at the London Institution, said,—"Considerable attention had been lately paid to the process of galvanising iron,—a discovery which promises to be of the highest utility. Mr. Nadsmyth, of Patricroft, near Manchester, and Mr. Owen, two gentlemen connected with the Government committee on the subject of metals, had lately been trying experiments, the result of which would indicate that, by giving iron a coating of zinc, or by combining zinc with iron in its manufacture, it would be much improved, preserved from oxidising, and rendered less brittle; and that old plates of iron—such, for instance, as had been used for the bottoms of ships—with an admixture of zinc, still possessed its original qualities; and, in fact, iron remelted from such plates was found to be of a better quality than at first. These experiments had, indeed, excited great attention to the important question, whether iron would not be improved by a small portion of zinc. Tinned iron, exposed to the atmosphere, very soon became oxidised; but in iron protected by zinc, although exposed to all weather, there was no change. Indeed, a piece made bright remained so after being placed in water for several months. The zinced iron, which was now used in roofing large buildings—as, for instance, the new Houses of Parliament—had the quality of becoming incrusted with a coat of oxide of zinc, which prevented any further destructive effects from exposure to the atmosphere."

THE LATE MR. H. LONSDALE ELMES.—We have already alluded to the too-brief career of this gentleman. We find the following in the current number of the *Art-Union Journal*. "A committee of Liverpool gentlemen, in 1836 or 1837, advertised for designs for St. George's Hall, which was then intended to be a building distinct and separate. This advertisement was cut out of the *Times*, and sent or handed to Mr. Elmes by one of his friends, as being worth his notice. Mr. Elmes, then very young, took it over to Mr. Haydon, and asked him if he should send in a design. 'By all means, my dear boy,' said Mr. Haydon; 'they are noble fellows at Liverpool. Send in a design, and mind, let it combine grandeur with simplicity. None of your broken-up and frittered abortions, but something *grand*.' 'Accordingly,' said Mr. Elmes, 'I set to work with a burning enthusiasm, and took my first sketch to a friend's house. It was handed round and admired. Amongst the company was a boy about four years and a half old. The sketch was of course shewn to the little fellow, who, looking for a moment very gravely at it, threw it down, saying, 'very good; very good, indeed: it's worth five hundred pounds.' This, of course, was laughed at, but hailed as a lucky omen.' The sketch was finished, and in due time came the welcome news, 'victorious,' with the five hundred pounds. Some time after followed prizes for the Assize Courts and the Collegiate Institution. St. George's Hall, the great work of the young architect's life, must be finished by others; but it will ever remain his own noble monument. We understand that Mr. Elmes has left his widow

and child unprovided for. Commencing life solely by his own means, his career has been all up-hill; and, perhaps, of all the learned professions, that of architecture is the worst paid: no expenditure appears to be so grudgingly laid out as an architect's commission. Mr. Elmes' commission of five per cent. on this building was restricted to 90,000*l.*; the expenditure will be about 154,000*l.* For the Collegiate Institution in this town he obtained the premium of 250*l.*; but the directors claimed the drawings, and, to save the commission, put them into the hands of a clerk of works; and Mr. Elmes, rather than have his details murdered, furnished them for nothing. These are two instances which have taken place in a town renowned for its great wealth and princely liberality all over the world. It is to be hoped that the claims of the widow and orphan will receive that attention and liberality of treatment, justly, honestly, and most righteously due to the man who has laid down his life in adorning the town of Liverpool with one of the finest architectural buildings in Europe."

The Health and Light Tax.—The delegates of metropolitan parishes appointed to obtain the immediate repeal of the window duties determined, at a meeting held last week, on sending a deputation to wait on the Chancellor of the Exchequer to bring the question forcibly under his notice. Following out a suggestion made in The Builder a short time ago, another association has been formed, to be called the London and Provincial Union for the Abolition of the Window Tax, "for the purpose of obtaining by every legal means the total and immediate abolition of that obnoxious tax."

Asphalted Brickwork.—Some parts of the citadel at Plymouth have been constructed of brickwork and Seyssel asphalte. The north embrasure of the old saluting battery, the first of the kind ever built, took 12 men four weeks to construct it, and was finished about three months since. The men worked under cover of tarpaulins, and had a furnace constantly lighted near them. Twelve tons scale weight of asphalte bricks and of liquid asphalte were consumed in its construction. Between the new work and the old the asphalte was poured in boiling hot. The bricks seem to be all completely welded together as if cast into a mould, and the experiment in every respect is said to be successful.

TENDERS

Delivered to the Assignees of Mr. Burton, of Lambeth, for building the new barracks at Portsea, viz.:—

Trego	£41,025
Piper	40,793
Hicks	40,370
Haynes and Co.	39,650
Nicholson	38,899
Busby	38,896
Harrison	38,224
Kelk	38,201
Locke and Nesham (accepted)	35,200

MEETINGS OF SCIENTIFIC BODIES

Held during the ensuing week.

Tuesday, February 8.—Institute of Civil Engineers, 8 P.M.

Wednesday, 9.—Society of Arts, 8 P.M.; Graphic Society, 7 P.M.

Thursday, 10.—Royal Society, 8½ P.M.; Society of Antiquaries, 8 P.M.

Friday, 11.—Archæological Institute, 8½ P.M.; Architectural Association.

TO CORRESPONDENTS.

"*The late Westminster Commission of Sewers.*"—We have received a reply from Mr. Phillips to a remark in a recent letter, but have not space for it in our present number.

"*Occasional Reader.*"—Two or three coats of paint on the ends of beams will be found useful.

"*R. G.*"—The insertion of his article would expose us to an action for libel.

"*J. L.*"—A valuer's licence may be obtained at Somerset House: the cost is, we believe, two guineas.

"*J. W.*"—We are unable to advise as to emigration.

"*Subscriber.*"—We know of no "paint for stucco which will stand well when exposed to a sea-air in a very open situation."

"*J. P. W.*"—Shall appear.

"*J. G. B.*"—The green slates in question are from Westmoreland.

"The Practice of Artists," "Filtering Water," "Use of Plaster of Paris," "Reviews of Books," &c., unavoidably postponed.

Received.—"C. T." (Oxford), "J. W.," "W. D.," "H. C." (shall see a proof), "M. H. C.," "R. T.," "H. L. T." (shall appear), "R. G.," "C. V." (shall appear), "J. B.," "A Subscriber," "J. S.," "An Old Builder," "E. A.," "C. A. H." (thanks), "F. P. D," "W. J.," "F. D."

ADVERTISEMENTS.

SURVEYING, ARCHITECTURAL, and ENGINEERING OFFICES, 24, Guildford-street, Russell-square, London, for Preparing, Training, and thoroughly Qualifying Gentlemen, in the most practical and scientific manner, for Surveyors, Levellers, Engineers, Architects, Builders, Draughtsmen, Measurers and Valuers of land, timber, buildings, townships, &c., and for giving practical instruction, on the New System, in every branch of the profession. Conducted by Messrs. HYDE, SMITH, and LEWIS, Civil Engineers, Architects, Surveyors, &c., of extensive practice. Terms, till perfect, very moderate. Pupils, on completing the course, may be introduced to employment.—For Prospectuses, &c., apply at the Offices.

TO BUILDERS, PAINTERS, AND OTHERS.

MESSRS. WOOD and Co., GRAINERS and WRITERS to the Trade only.
79, York Road, Lambeth; and at 28, Cross Street, Blackfriars Road.

HERRING'S PATENT SAFETY WINDOW.—No invention ever offered the advantages to builders and the public; it will positively add 5 to 10 per cent. to all houses having it; repay the cost every two years; abolish all danger to life and limb, cleaning and repairing. It is in full operation (four different ways), forms a complete ventilator and sun-blind; all simple, cheap, and effective.—Apply for licenses, and to inspect its real merits, to HERRING'S Patent Steam Bed-Feather Factory, 14, Kingsgate-street, London.

RAIN-WATER PIPES, Heads, Shoes, and Elbows, Half-round and O G Gutters, Sash Weights, Railing Bars, Sink and Stable Traps and Gratings, Air Bricks, Coal Plates, &c.; Gas and Water Pipes from 1¼ inch. to 12 in. in diameter, with Bends, Branches, Syphons, and Lamp Columns; also Hot-water Pipes, with all the usual connections. A large Stock of the above Castings at JONES'S Iron Bridge Wharf, No. 6, Bankside, Southwark.

FLEXIBLE PIPES AND TUBING, FOR PUMPS, ENGINES, GAS, &c.

PATENT VULCANIZED INDIA-RUBBER HOSE-PIPE and TUBING of every description. These Pipes are made to stand hot liquor and gas without injury; and as they do not become stiff in the coldest temperatures, or require any application when out of use, are particularly well adapted for Fire-Engines. Vulcanized India-rubber Washers for steam and hot-water joints, &c., of all sizes.—Sole Manufacturer, JAS. LYNE HANCOCK, Goswell-mews, Goswell-road, London.

TO GAS COMPANIES, Gas Fitters, and Gas Consumers.—N. DEFRIES, 10, Hampstead-road, 67, St. Martin's-lane, and 118, Argyle-street, Glasgow, having proved by eight years' experience his DRY METER to be unrivalled, begs to say, that nearly 20,000 are now in use, defying injurious Gas, and are never affected by Heat, Damp, or Frost. They may be obtained on Hire of all the Gas Companies who supply Meters to their Customers.—Testimonials of great value may be obtained at either Factory.

DOMESTIC GAS FITTINGS. — The cleanliness, cheapness, brilliancy, and safety of this mode of lighting private residences are leading to its general adoption. GEORGE and JOHN DEANE'S stock of LAMPS, Chandeliers, Brackets, &c., is very large, and exhibits the most elegant and modern designs. G. and J. DEANE fit up single apartments or houses on true scientific principles, and in the most artistic style; and as every thing is got up in their own workshops, G. and J. DEANE can engage for the strictest punctuality and the lowest possible charges.—N.B. Plans and estimates prepared.—GEORGE and JOHN DEANE, Gas-fitters, opening to the Monument, 46, King William-street, London-bridge.

ESTABLISHED 1795.
NOT TO BE EQUALLED IN PRICE AND QUALITY.

PATENT-IMPROVED and PANELLED IRON SAFES, DOORS, BOOMS, CHESTS, &c.—E. TANN and SONS' Patent Reliance Chemical Compound-filled Safe stood the test at the late fire, with loss of life, at Water-lane, Blackfriars, and preserved its contents. The Safe may be seen at the Patent Reliance Guarded-lever Lock and Safe Manufactory, 1, Hope-street, Hackney-road. Iron Doors for Party-walls, Safes, &c., kept in stock.—N.B. The Trade supplied.

By Her Majesty's — Royal Letters Patent.

BAILLIE'S PATENT ROUNDED RIM LOCKS,
WITH SECRET AND SECURE FIXINGS.

THIS CHEAP and USEFUL ARTICLE obviating the unsightly appearance and insecurity of the common rim lock, can be obtained from the Manufacturers, Messrs. CARPENTER and TILDESLEY, Willenhall; or from the sole Agent, Mr. JOHN FAULKNER, Ironmonger, 62, St. Martin's-le-Grand, London, opposite the new Money-Order Office.

IRON FOUNDRY, 9, Brick-lane, Old-street, St. Luke's.—J. J. JONES having made great additions to his STOCK OF PATTERNS, begs to inform the Trade, that he can now supply them with Plain and Ornamental Iron Columns, Girders, Railings, Gates, Iron Coping, Balconies, Window Guards, Verandahs, Ornamental Staircase Panels, Iron Staircases, Tomb Enclosures, Trellis Panelling, Lamp and other Brackets, Cantilevers, Newel Bars, Water Closet Work, Area Gradings, Fly and other Wheels, Wheel Plates, &c.
BAKER'S OVEN WORK, Forge Backs and Troughs, Rain Water Pipes and Gutters, Sash Weights, Furnace Bars, Stoves, Ranges, &c., always in stock.

IRON FOUNDRY,
168, DRURY-LANE, and CHARLES-STREET, DRURY-LANE.
JOSEPH GLOVER,
Solicits the attention of the Trade to his extensive Stock of PATTERNS for CASTINGS of EVERY DESCRIPTION, consisting of those for every purpose, either structural or ornamental.
Wheel Pinion and Steam-Engine Patterns; Range Stove and Hot Plate Metal.
A stock of Rain-Water Pipes, Plain and O G Guttering, Air Bricks, Sash Weights, &c. &c.
A very superior description of Soot Door, particularly suitable for internal work, being perfectly secure, and not unsightly.
ESTIMATES given for IRON ROOFING and every description of Ironwork, complete to specification, and the work executed with every attention to quality and dispatch.
GLOVER'S FOUNDRY,
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SMITH and ENGLISH, Princes-street, Leicester-square, London, beg to inform Architects, Builders and others, that the above form of Lightning Conductor has been most extensively adopted, and is giving the greatest satisfaction, it proving considerably cheaper first cost, much simpler of application, with less injury to the building, than any other kind, and they can refer with great satisfaction to eminent architects and others, who have adopted it in preference;
As also their much improved Revolving and Panelled Iron Shutters,
PATENT DOUBLE-ACTION DOOR-SPRINGS,
PATENT CASEMENT FASTENINGS AND SILL-BARS,
Patent Copper and Iron Wire Sash Lines,
IMPROVED FLOORING-CRAMPS, &c. &c.,
which they continue to manufacture extensively, adopting every improvement which experience and practical application can suggest.

PORTER'S CORRUGATED and PATENT GALVANIZED IRON ROOFING WORKS, Southwark-bridge (and the Grove), Southwark. At the above Works, the Public are secure in having the superior make, and by the Patent process of Galvanising Iron as first introduced into this Country, with many improvements in its application to Roofs, Buildings, &c. Every description of Building, Railway, and other Iron and Smith's work Manufactured of the best quality. Iron and Fence Hurdles as usual.—The Trade supplied.

IRON-WORK FOR BAKERS' OVENS.

F. A. TIDDEMAN, Purfleet Wharf, Earl Street, Blackfriars, keeps an assortment of Stocks, or Mouthpieces; Plates, Furnace-bars, Top and Fall Pieces, Stoppers, Chimney-bars, Inside, Outside, and Ash-pit; Doors and Frames, Boilers and Frames, Lamps, &c., &c.; all of the best description, at very moderate prices.—CAST-IRON UPSETS.

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R. HENLY and Co., WHOLESALE IRONMONGERS, and Manufacturers of KITCHEN-RANGES, STOVES, &c., 196, Blackfriars-road, and 117, Union-street, Borough.

Strong Self-acting Kitchen Ranges, with Back Boiler and Oven, and Wrought Bars:—

3 ft.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft.
£3. 6s.	£3. 13s.	£3. 16s.	£4.	£4. 10s.

Henly's Patent Improved, with back Boiler and Wrought Iron Oven:—

3 ft.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft.
£5.	£5. 15s.	£6. 5s.	£6. 10s.	£7.

Best Register Stoves, at 7d., 8d., and 9d. per inch.
Do. Elliptic do., at 3½d., and 4d. do.
Manufacturer of WOLFASTON'S PATENT REGISTER STOVES, a certain cure for SMOKY CHIMNEYS, and effecting a great saving in fuel. To be seen in use daily.
Orders from the Country, accompanied with a remittance or reference, will meet with prompt attention.

TO BUILDERS and CARPENTERS.—Elliptic Stoves, double backs, 3d. per inch. Registers, 6½d., 7d., 8d. per inch.
Cottage Ranges, with Oven and Back Boiler, 3 ft., 38s.; 3 ft. 2 42s.; 3 ft. 4, 44s.; 3 ft. 6, 46s.
Self-acting Ranges, with Circular Oven and Back Boiler, best Wrought Bars and Bright Fittings,
3 ft., £3. 3s. 3 ft. 6, £3. 12s. 6d. 4 ft., £4.
Best Patent Cut Clasp.

5d.	6d.	8d.	11d.	1s. 4d.	1s. 10d. per 1,000.
3d.	4d.	6d.	8d.	10d.	90d.

Best Sheet Floor Brads 14s. per cwt.
Best Town Glue 38s. Do. Scotch, 52s. per cwt.
Best Patent Sash Line.

4s. 3d.	5s.	6s. 6d.	7s. 6d.	10s.	12s. per gross.
1	2	3	4	5	6

At F. R. WILLIAMSON'S IRONMONGERY and STOVE WAREHOUSE, 35, Chiswell-street, Finsbury-square.
Lists of Prices had on application at the Warehouse; if by letter pre-paid, inclosing postage stamp.

OLD-ESTABLISHED WHOLESALE IRONMONGERY WAREHOUSE, Kitchen-range, and Stove-grate Manufactory, 18, Cross-street, Walworth.
JOHN GRICE most respectfully solicits the attention of Architects, Builders, and Carpenters, to his Stock of Black and Bright Stoves, Kitchen Ranges, &c., &c.
Black Registers, from 6½d. per in. and upwards.
Bright ditto with Black and Bright Bars, 3l. 10s. and upwards.
Self-acting Kitchen Ranges, with Oven and Back Boiler, Wrought Bars, Fittings Bright:—

3 ft.	3ft. 6 in.	4 ft.
3l. 3s.	3l. 14s.	4l. 5s.

All articles made on the premises and warranted, and delivered free of expense within five miles of London. Bell-hanging in superior style, hung in secret, 9s. per pull.

R. FULKES, Wholesale Ironmonger, Stove and Range Manufacturer, 91, Park-street, Camden Town, London.
Best Cut Clasp Nails, 16s. per cwt.
Best Cast Lath Nails, 11s. 6d. per cwt.
Best 6-inch Mortice Locks, with large Brass Furniture.
Fitted with Duces' Patent Spindles, 36s. per dozen.
Best Butt Hinges, 2 in. 2½ in. and 3 in.
1s. 2d. 1s. 6d. 2s. 6d. per dozen pair.
Elliptic Stoves, 3d. per inch.
Register Stoves, 6½d. per inch.
Best Self-acting Ranges, fitted complete—

3 ft.	3 ft. 6 in.	4 ft.
60s.	70s.	80s. each.

Orders from the country, containing a remittance or Post-office order (made payable at the Camden Town Post-office), forwarded same day.

TO BUILDERS AND CARPENTERS.

BURT and POTTS, York-street, Westminster, Wholesale and Retail Ironmongers, Smiths and Stove Grate Manufacturers. Delivered free within five miles.
Cast Iron Rain-water Pipe:—

2 in.	2½ in.	3 in.	3½ in.	4 in.
1s. 1d.	1s. 3d.	1s. 5d.	1s. 9d.	2s. 3d. per yard.

Sheet Floor Brads, 14s. per cwt.
All other Nails in proportion.
Register Stoves with inside backs, 6½d. and 7d. per inch, and upwards.
A variety of Best Black Ground and Bright Register Elliptic Stoves, with inside back, 3½d. per in.
Self-acting Ranges with Circular Oven, Back Boilers, and Wrought Bars:—

3 ft.	3 ft. 6 in.	4 ft.
£3.	£3. 8s.	£3. 15.

Iron and Steel of every description.

IRONMONGERY WAREHOUSE, 18, Blandford-street, Manchester-square, leading from Baker-street, Portman-square.
TO BUILDERS and CARPENTERS.—In consequence of the recent reduction in the Price of Iron, the following are the present Prices of the undermentioned articles at the above Warehouse:—
Best Patent Cut Clasp.

4d.	6d.	10d.	20d.	per 1,000.
6d.	8d.	1s. 4d.	1s. 10d	"

Cast Butts.

2 in.	2½ in.	2½ in.	3 in.	per doz.
11d.	1s. 2d.	1s. 4d.	2s.	

Best Patent Sash Line.

3	4	5	6	per doz. knots.
6s. 6d.	7s. 6d.	10s.	12s.	

Every other article equally reasonable.
Catalogues of Prices can be had on pre-paid application, inclosing postage stamps.—Country orders will meet with immediate attention, and will be executed either upon the receipt of a remittance for the same, or upon the giving a satisfactory reference in London.
JOHN and EDWIN YOUNG, Proprietors.

FENDERS, STOVES, and FIRE-IRONS.—The LARGEST ASSORTMENT of STOVES, KITCHEN RANGES, and FENDERS, as well as General Ironmongery in the world, is now on Sale at WILLIAM S. BURTON'S (late RIPPON and BURTON'S) extensive warehouses. Bright steel fenders, to 4 feet, from 30s. each: ditto ditto, with or-molu ornaments, from 60s.; rich bronzed scroll ditto, with steel bar, 10s. 6d.; iron fenders, 3 feet, 4s. 6d.: 4 feet, 6s.; ditto bronzed, and fitted with standards, 3 feet, 9s.; 4 feet, 11s.; wrought iron kitchen fenders, 3 feet, 4. 6d.; 4 feet, 6s.; bright register stoves, with bronzed ornaments, and two sets of bars, from 80s.; ditto ditto, with or-molu ornaments, from 6l. 6s.; black dining-room register stoves, 2 feet, 18s.; 3 feet, 27s.; bed-room register stoves, 2 feet, 16s.; 3 feet, 24s. The new economical thermio stove, with fender and radiating hearth-plate; fire-irons for chambers, 1s. 9d. per set; handsome ditto, with cut heads, 6s. 6d.; newest pattern, with elegant bronzed heads, 11s. A variety of fire-irons, with or-molu and richly cut heads at proportionate prices. Any article in the furnishing ironmongery 30 per cent. under any other house. The money returned for every article not approved of. Detailed catalogues with engravings sent (per post) free.
WILLIAM S. BURTON'S (late RIPPON and BURTON'S) stock of general furnishing ironmongery is literally the largest in the world, and as no language can be employed to give a correct idea of its variety and extent, purchasers are invited to call and inspect it.—39, Oxford-street (corner of Newman-street). Established in Wells-street 1820.